

# NetworkWorld

The leader in network knowledge ■ www.nwfusion.com

January 12, 2004 ■ Volume 21, Number 2

## A Wider Net

Old net start-ups never die, they just become alumni clubs

Packing them in at the 'Chipcom prom.'

■ BY BOB BROWN

As Fanny Mlinarsky squeezed her way through the crowded Cambridge Hyatt cocktail lounge at last fall's Chipcom reunion, she could hardly wait to reveal what hid in the small Estée Lauder shopping bag in her clutches. Leaping at her opportunity during a break in conversation with her former manager, Menachem Abraham, she sprung open the bag and yanked out... a circuit board.

Of course, this wasn't just any board. Rather, it was prototype No. 1 from an Ethermodem, the very first product made by the now-defunct network equipment maker, which 3Com gobbled up about eight years ago.

"We were 20 years ahead of our time with that cable

See Alumni, page 16

# Wireless LAN worries

Despite security advances, implementation and interoperability obstacles loom.

■ BY ELLEN MESSMER

This is supposed to be the year that the industry addresses the serious security shortcomings that are holding back enterprise wireless LAN rollouts. But looming implementation issues and vendor disagreement are raising questions about just how soon the security dilemma will be solved.

The 802.11i protocol for wireless encryption is on track to become an IEEE standard by June, but it looks like existing WLAN customers seeking to adopt it will need to swap out hardware instead of just upgrading software. In addition, Cisco and Microsoft have gone their separate ways on a WLAN authentication technology called

Protected Extensible Authentication Protocol (PEAP), creating a schism that could result in interoperability issues.

The 802.11i protocol for shielding wireless data from over-the-air attacks is intended to replace the Wi-Fi Protected Access (WPA) specification that the Wi-Fi Alliance put forward in late 2002 as an interim replacement for the flawed Wired Equivalent Privacy (WEP) encryption standard. But however promising 802.11i seems, it won't be as simple to adopt as say, WPA, which only called for a software upgrade.

Because of its more intensive encryption processing, 802.11i will require an entirely new wireless access point in many cases. That has WLAN vendors and

See WLAN, page 12

# Ultra Wideband's destiny up in the air

■ BY JOHN COX

A decision at an IEEE meeting this week could bring together two factions battling over a new wireless technology. But it's more likely to drive them to all-out market warfare.

Cut-throat capitalism might prove to be the fastest and most efficient way to create a de facto standard for Ultra Wideband (UWB) wireless networking. Advocates say UWB could become the wire-

less equivalent of USB to link an array of mobile devices and consumer electronics at distances up to 30 feet and at data rates of up to 480M bit/sec.

In corporations, UWB could become the main way that notebooks and PDAs connect with peripherals and share multimedia data in an ad hoc manner.

The IEEE 802.15.3a Task Group (TG3a) is charged with

See Ultra Wideband, page 10

# High-flying glory days past, Microsoft builds for future

■ BY JOHN FONTANA

Microsoft's mettle has been tested before, but in the next few years the company will face what are arguably its toughest challenges yet.

These include:

- Finding growth opportunities to offset the maturing of its operating system and Office businesses.
- Winning back the trust of customers fed up with security shortcomings and what they see as inflexible licensing schemes.
- Fending off stronger open

source competitors as the company creates its next-generation platform, code-named Longhorn.

The world has changed since Microsoft went public in 1986. Gone are the days of 30% to 50% annual growth rates while chewing up competitors. Over the past three years, the company has averaged 11.5% revenue growth, and its stock price has only gone up 1% over the past 52 weeks.

The company even issued its first-ever dividend to stockholders

See Microsoft, page 56

## Review

### SSL VPN GATEWAYS

**NetScreen**  
wins our test of  
seven SSL VPN  
gateways;  
**Nokia** comes in a close  
second.

**Page 43.**



The NetScreen-SA 5000 showed great application support and access control mechanisms.

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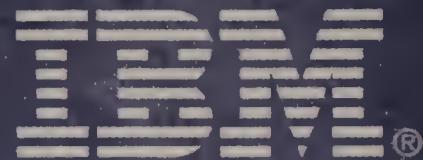


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# NetworkWorld

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The latest BlackBerry sports a walkie-talkie feature. Page 36.

## Features

**Face-off:** Can rogue wireless LANs be eliminated? Marvin Chartoff of Unisys says yes, but Brian Boyland of Cap Gemini Ernst & Young disagrees. **Page 41.**

## Review SSL VPN GATEWAYS



WORLD  
CLASS  
*Winner*

We put seven SSL VPN gateways to the test. NetScreen came out on top based on its application support, access control and interoperability. F5, Nokia and Symantec were also impressive. **Page 43.**

## NetworkWorldFusion

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## Interactive

### Review: Linksys in the living room

We test four wireless entertainment products — from video cameras to gaming adapters — and let you know which are worth your time and money.

**DocFinder:** 9240

### CES 2004 news

If you didn't hit Las Vegas last week for the Consumer Electronics Show, it's OK. We got you covered. Get all the news and inside scoop from what's becoming the hot new IT show.

**DocFinder:** 9241

### Top ISP Report — November

Does your ISP measure up? Find out with our Top ISP Report, a joint venture between *Network World* and VeriTest's Internet BenchMark service.

**DocFinder:** 9141

## Seminars and events

### Today's business demands more of network IT managers

Maximize performance from current applications, optimize usage of available bandwidth and integrate operations with overall business objectives. Here's February's free Network World Technology Tour to the rescue. Attend "Network Management: The New Business Focus," and master the secrets of success. Upcoming sessions are in New York, Atlanta, Chicago and Santa Clara.

**DocFinder:** 9139

## Columnists

### Wireless Wizards

RF prediction vs. site surveys

The Wizards help Chris in Cleveland learn the difference between an RF prediction and a site survey, and whether wireless LAN deployments are better-suited for one or the other.

**DocFinder:** 9242

### The Multimedia Exchange

Real hits 10

Multimedia Editor Jason Meserve takes note of RealNetworks celebrating its 10th anniversary with a bang. Last week it released a new player, codecs and music download store.

**DocFinder:** 9243

### Small Business Tech

New NAS falls short

Columnist James Gaskin says Linksys' EFG120 is only a partial upgrade from last year's version.

**DocFinder:** 9244

### Home Base

Giving up Microsoft Office

Columnist Ron Miller talks to one small business that switched to OpenOffice to escape Microsoft product activation fees. **DocFinder:** 9245

## Breaking News

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# News Bits

## WorldCom back in government's good graces

The U.S. government's General Services Administration last week lifted restrictions against WorldCom, better known by its MCI brand name, which prohibited the telecom company from bidding on federal contracts. The GSA placed MCI in its Excluded Parties Listing System last July after the accounting scandal that forced the company to seek bankruptcy protection. At the time, the GSA cited problems with the company's internal accounting controls and business ethics. Since then, the GSA has conducted an "exhaustive review" into the company's business practices and now has concluded that MCI has remedied its problems in the two areas. The GSA, which sets government procurement policy, also had been conducting debarment proceedings against MCI, which would have resulted in longer-term restrictions.

## Changes in latitudes

VeriSign said last week it is planning changes to a DNS component that coordinates updates to the .com and .net domains throughout the DNS system. The changes are intended to prepare .com and .net for more frequent daily updates of information such as address changes. Internet users and organizations managing Web sites on .com and .net will not notice the change, VeriSign said. However, some network experts worry that the change, which is scheduled for Feb. 9, might have unanticipated consequences that could interrupt traffic to some .com and .net Web sites and other online services. The modifications will change the way part of a DNS component called the Start of Authority Record is generated for .com and .net domains. The records are used to manage areas of an Internet domain that are controlled by a single DNS server. VeriSign Naming and Directory Services will change the serial number format in the .com and .net zones' Start of Authority Records. Currently, the serial number format is YYYYMMDD, plus an additional two-digit number (00 to 99) that is updated whenever the zone data is updated. Under the new system, VeriSign will change the serial number to a unique value equal to the number of seconds since 00:00:00 Greenwich Mean Time on Jan. 1, 1970. The move will let VeriSign make better use of its Advanced Transaction Lookup and Signaling system to make more frequent and efficient updates to .com and .net, from the current system of two daily updates.

## CRM buys shrink market by two

Two acquisitions announced last week continue the CRM market consolidation that's been going on the past few years and highlight the importance of adding a personal touch to companies' online customer service efforts. Both acquisitions pair a knowledge management tools vendor with a Web collaboration technology vendor. CRM suite vendor Kana is acquiring Hipbone, which specializes in online customer service technologies such as co-browsing, file sharing and chat, for an undisclosed amount. Meanwhile, LivePerson, which makes chat, e-mail management and customer self-service software, acquired some of Island Data's assets — specifically its knowledge management technologies — in a \$3 million stock and cash transaction. Kana plans to integrate Hipbone's chat and co-browsing features into its iCare suite, which includes knowledge management, e-mail marketing, call center, marketing and analytics applications. Kana also will continue to offer Hipbone as a stand-alone product, the company says. For its part, LivePerson acquired Island Data's Express Response, a hosted knowledgebase and frequently asked questions service. Existing Express Response customers — which include Adobe, Canon U.S.A. and Cox Communications — will be transferred to LivePerson.

## The Good The Bad The Ugly



### Web Sir-ver. Tim

Berners-Lee, inventor of the Web and director of the World Wide Web Consortium, has been knighted by Queen Elizabeth in honor of his efforts. Berners-Lee, a British citizen who lives in the U.S., said, "I accept this as an endorsement of the spirit of the Web; of building it in a decentralized way; of making best efforts to keep it open and fair; and of ensuring its fundamental technologies are available to all for broad use and innovation, and without having to pay licensing fees." ▶



**Britney tops the Web charts.** Something seems very wrong about the fact that just as Berners-Lee is being knighted, Google announces that Britney Spears was the most searched-for subject on the Web in 2003. And of course her Las Vegas marriage-then-annulment to start the year should keep her hot for at least a bit longer.



**Wi-Fi goes Hollywood.** The folks at the Wi-Fi Alliance must have been thrilled when detectives from the "CSI: Miami" TV show were chatting away on the topic during an episode earlier this month. That was until it turned out a murder victim was found to have been surreptitiously using the technology from his office to tap into an access point across the street to avoid the spyware his company installed to keep track of employees. Turns out he was soliciting hookers from one of those sorority Webcam sites.

## IBM continues Linux lovefest

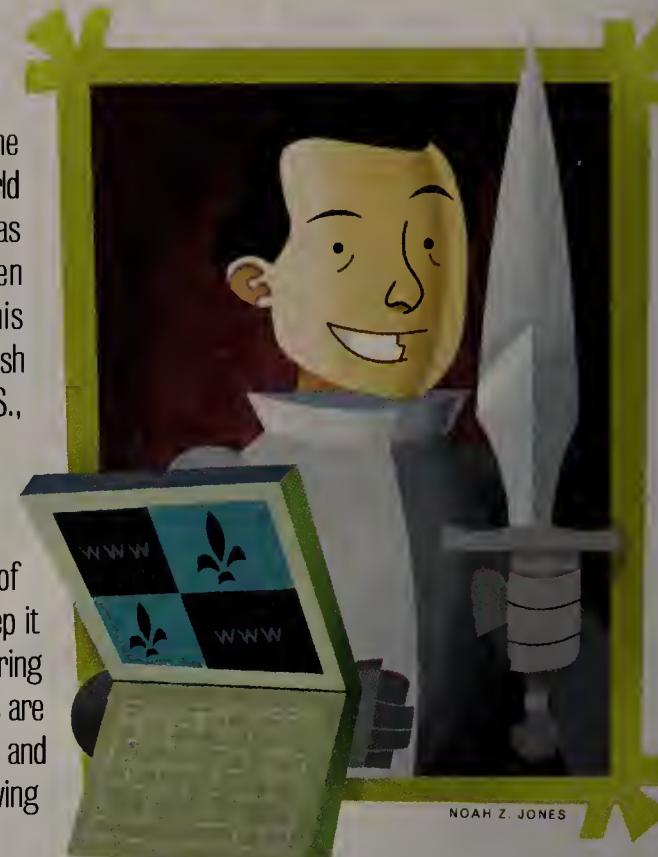
IBM Chairman and CEO Sam Palmisano has challenged his company to move to the Linux desktop over the next two years, according to an internal memo from IBM CIO Bob Greenberg. "Our chairman has challenged the IT organization and indeed all of IBM to move to a Linux-based desktop by the end of 2005," Greenberg wrote. "This means replacing productivity, Web access and viewing tools with open standards-based equivalents." The company has formed a new initiative called the Open Desktop project office to facilitate the move, which will involve contributions from Greenberg's office and from IBM's software and research groups, according to the memo.

## RFID to gain strength

Retail spending on radio frequency identification technology will increase more than tenfold over the next four years, according to projections announced last week by IDC. The research firm predicts RFID spending for the U.S. retail supply chain will grow from \$91.5 million in 2003 to nearly \$1.3 billion in 2008. Mandates for RFID tagging from Wal-Mart Stores and the U.S. Department of Defense will drive this accelerated spending — but it won't be sustained, IDC says. Once manufacturers' and distributors' initial deployments are complete, RFID spending will level off as the industry prepares itself for the next wave of RFID: item-level tagging.

## Big Blue trims workforce

IBM said last week it has cut about 300 U.S.-based software jobs and 100 positions in its services division. The job cuts come as part of an effort to reduce costs and emphasize other areas such as software telesales and technical sales, IBM said. The 300 software job cuts represent less than 1% of IBM's 38,000 worldwide software positions.



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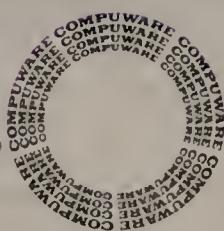
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# Holiday rush pushes retailers to spend

National Retail Federation to showcase aisles of wares to improve operations.

■ BY ANN BEDNARZ

Flush from a strong holiday shopping season, retailers are gathering this week in New York to hear about a slew of technologies aimed at helping them improve in-store and online operations.

The National Retail Federation's (NRF) annual conference and exposition will feature about 350 exhibitors and dozens of

educational sessions focused on retaining customers, improving supply chains and increasing margins. NRF expects 12,000 attendees.

Analysts expect retailers to be in buying mode this year, even though their IT budgets are expected to remain relatively flat. Budgets are predicted to grow modestly from an average of 2.75% last year to 2.88% this year, according to AMR Research.

However, pent-up demand for IT upgrades — to newer point-of-sale systems, for example — might accelerate some spending.

"With last year's economy not as good as everyone had hoped, some technology decisions were delayed," says Sunita Gupta, a vice president at retail management consulting firm LakeWest Group. "But there comes a time when retailers have to move forward, especially the ones that have software and hardware that is eight or nine years old."

In addition, healthy holiday sales may kick-start spending.

Holiday online shopping tallies surged to \$12.5 billion during the period from Nov. 1 through Dec. 31 — a 30% increase over last year, according to Internet tracking firm comScore Networks.

In-store sales, too, were upbeat at some big retailers. Best Buy last week announced a 9.3% increase in December store sales over last year, and Wal-Mart and Target reported store sales up 4.3% and 4.1%, respectively, for that period.

At the NRF show, Gupta predicts retailers will be on the lookout for POS products, radio frequency identification (RFID) technology, and a variety of specialty software products for tasks such as merchandise planning, forecasting and replenishment.

"POS continues to be on CIOs' minds," Gupta says. In LakeWest's annual POS benchmarking survey released last week, 37% of respondents said they plan to replace their POS hardware, and 38% plan to replace their POS software, within the next two years. "That means they're going to be out there looking," Gupta says.

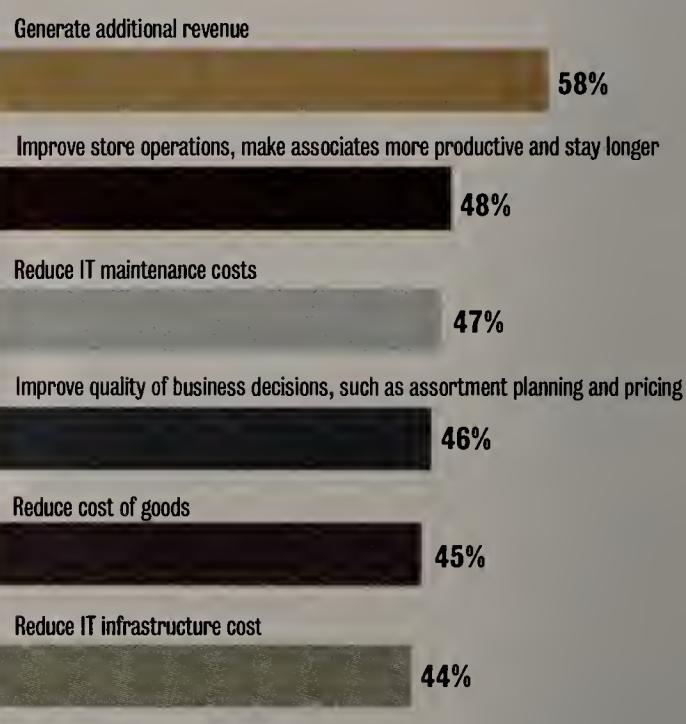
As for RFID, most retailers are more interested in browsing than buying at this point, she says.

AMR Research recommends retailers focus their IT investments in four key areas: customer-facing technology that enables more-interactive selling; analytic tools that project the impact of merchandising, pricing and promotion decisions; pricing-management tools that track product and pricing strategies from introduction through final closeout; and sourcing technologies that let retailers adjust manufacturing and supply-chain strategies based on consumer demand changes.

In addition, AMR suggests work-

## IT purchasing rationale

Retailers say revenue growth is the primary justification for new software investments, according to an AMR Research survey of 67 retail IT executives. Top benefits used to justify software investments are:



Note: Multiple responses were allowed.

# Veritas buys utility computing company

■ BY DENI CONNOR

Veritas Software last week shored up its utility computing vision with a \$59 million buyout of Ejasent, a 5-year-old vendor of application virtualization software.

Ejasent makes software to non-disruptively move applications from server to server based on rules set by an IT manager. It also offers chargeback software, an essential part of any utility-computing implementation in that it lets customers be charged for their actual use of assets.

Eric Ubels, CIO for international accounting firm Deloitte in Amsterdam, uses Veritas Cluster Server and is familiar with Ejasent's products.

"Ejasent can virtualize clusters and make applications that are not cluster-aware, basically cluster-aware, which is very interesting," he says. "If you have to do maintenance on a machine, you can automatically transfer the application to another machine, do the maintenance and then transfer it back."

Ejasent's products fit with Veritas' other products, including those obtained from earlier acquisitions of Jareva Technologies and Precise Software Solutions (see graphic).

A company using Veritas Cluster Server could monitor its systems' performance and capacity with Precise's i3 software, provision more resources with Jareva's OpForce software and shift around applications using Ejasent's UpScale. Ejasent's MicroMeasure could be used to charge back departments for resource use.

Veritas initially will sell the Ejasent products as they are, but by mid-2005 plans to have UpScale integrated with Veritas Cluster Server and MicroMeasure bundled with its Command Central product. ■

## Savvy shopper

**Veritas has acquired a handful of companies whose technologies are designed to help customers make computing resources available to end users and applications as needed.**

**January 2004**

**Ejasent.** UpScale application availability and automation software; MicroMeasure chargeback and reporting software.

**December 2002**

**Jareva Technologies.** OpForce server provisioning software.



**2003**



**June 2003**



**Precise Software Solutions.** Application performance management software.

force optimization tools can yield labor and scheduling efficiencies. Retailers currently allocate 32% of their store operations budget to workforce management applications, according to the research firm.

New products being unveiled at the NRF show align well with these areas, such as:

- **Marketing assistance:** Blue Martini is expected to announce Messages@POS, an in-store selling application for retailers that delivers personalized marketing messages to customers at POS. Triggered by the purchase of a particular brand or spending amount, the messages might promote store events, new merchandise or special offers.

- **Pricing expertise:** 4R Systems is expected to unveil MaxOut, an optimization tool designed to help retailers identify the most profitable end-of-life merchandising tactics, such as markdown, consolidation and liquidation.

- **Inventory tools:** Retail Technologies International will demonstrate the latest version of its Retail Pro store management software, due out this month. New features — such as serial number tracking and multi-vendor item identification — are aimed at

helping retailers better manage and track their inventory.

- **Workforce efficiencies:** POS and back-office software maker 360Commerce in December acquired Simplified Workforce Solutions for its workforce management software, which is designed to help companies control labor costs and reduce employee turnover. The first integrated products will be on display at NRF, the company says. ■

**Be a Net Know-It-All**

■ THIS WEEK'S QUESTION:

New Motorola Chairman and CEO Ed Zander formerly served as president of which computer company?

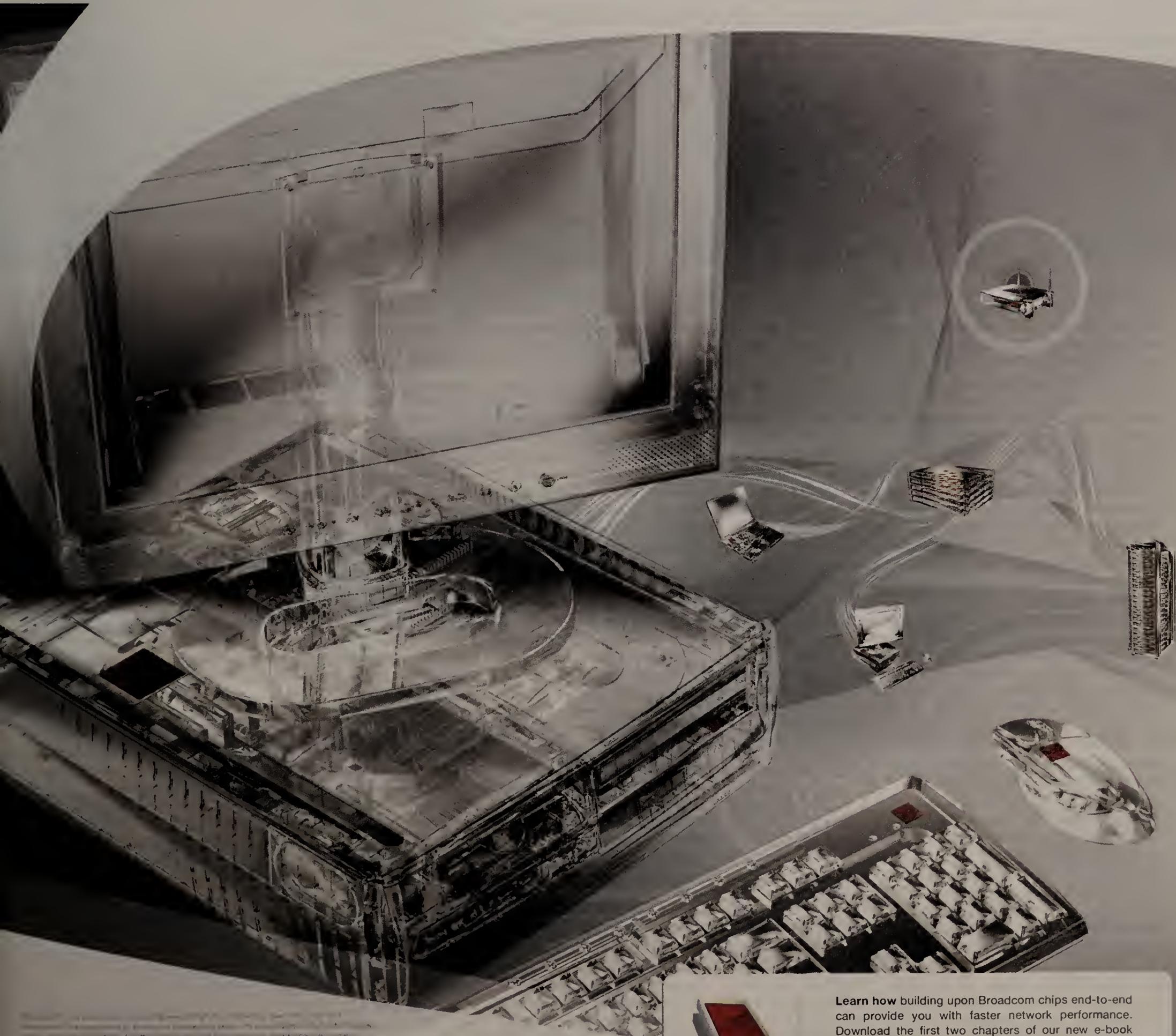
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# Verizon to spend \$3 billion on broadband offerings

■ BY JIM DUFFY

Verizon last week said it would spend \$3 billion over the next two years to bring broadband networks to the mass market.

The investment will include two network expansions and the rollout of a service and product to help businesses and residences integrate and manage disparate communications devices and applications.

The new service, called iobi, is designed to utilize the carrier's wireline, wireless, data and IP networks to link a customer's various communication devices into a customized personal communications network.

It's intended to let customers manage phone calls, voice mail, calendars, address books and e-mail using wireline and wireless phones, computers, laptops and PDAs. For example, what someone sends as a voice message from a landline or cell phone can be received as an e-mail or text message on a PDA or laptop, or redirected to a different phone line. The service can locate customers and customize communications delivery based on preference or time of day, Verizon says.

Verizon will introduce iobi later this year.

A new product called Verizon One combines a DSL modem and wireless router with a touch-screen computer and a cordless telephone, and is configured for the iobi service.

Customers can use Verizon One to call with one click from their address book or online directory assistance; view information from various news, weather or entertainment sources; scroll through Verizon SuperPages.com to look up and call phone numbers; leave text messages; manage calls; schedule call forwarding; and manage contact lists and calendars.

Verizon plans to introduce a version of Verizon One later this year.

The network expansions involve Verizon's wireless and wireline networks. Verizon Wireless will expand its 3G mobile data BroadbandAccess network nationwide over the next two years. In addition to its ongoing annual capital investment, Verizon will invest an additional \$1 billion over the next two years to further deploy its Evolution-Data Optimized (EV-DO) broadband technology.

BroadbandAccess is based on Code Division Multiple Access technology and boasts average user speeds of 300K to 500K bit/sec. The service will be available to business and individual customers in portions of the Verizon Wireless network this summer and in additional markets through 2005, the carrier says.

Verizon says it also will accelerate the evolution of its nationwide wireline network to packet-switching technology. Earlier this week, Verizon announced that it has selected Nortel to supply VoIP equipment for both local and long-distance applications.

The company says it will create the nation's largest converged IP network. In this effort, the carrier has invested \$55 billion in its network infrastructure since 2000.

"Verizon is largely responding to AT&T Wireless' nationwide launch of EDGE [Enhanced Data Rates for Global Evolution], the proliferation of Wi-Fi from the likes of T-Mobile and others, and Sprint's intimation that it intends to launch EV-DO in the next several years, all while the competition clamors for core enterprise customers," Eddie Hold and Jeffrey Rickard of Current Analysis said in a recent report on Verizon's plans.

Cingular Wireless, which SBC and BellSouth operate jointly, is also evolving its network toward a 3G infrastructure based on EDGE. ■



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## Ultra Wideband

continued from page 1

crafting a high-speed, physical-layer standard for handling wireless multimedia traffic. The parent 802.15 group is developing standards for so-called personal-area networks, including those based on two other wireless technologies, Bluetooth and Zigbee. Task Group 3a members earlier this year winnowed 23 proposals down to two, both based on UWB (see graphic). About 60% have voted in three meetings for one proposal, from the MultiBand OFDM Alliance (MBOA). In effect, 40% prefer the DS proposal. But any proposal needs 75% to be adopted.

The task group has been deadlocked since July, acknowledges Bob Heile, who chairs the TG3a and 802.15 groups. "We have two positions that are both claiming to best satisfy the market requirements, and no ability to prove [their claims] one way or the other," he says.

UWB's roots go back nearly 40 years. Until recently, UWB has been limited mainly to classified defense communications and to systems such as ground-penetrating radar or wall-penetrating imaging. Then, in early 2002, the FCC ruled that UWB radios could run on a given chunk of public spectrum (3.1 to 10.6 GHz) under strict limits.

Conventional radios, such as those in WLANs, have a single radio signal called a carrier wave that beams over a specified frequency. By contrast, UWB doesn't use a carrier wave; instead it uses short pulses of energy and spreads them over a range of frequencies using well-known modulation techniques such as orthogonal frequency division modulation (OFDM) or direct sequencing. These two techniques are the basis of the rival proposals offered to TG3a. In both cases, advocates say the result is very high bandwidth, very low power, and relatively simple and inexpensive radios.

## Competing proposals

MBOA is a group of about 40 vendors including most of the world's biggest makers of semiconductors, consumer electronics and computers.

The MBOA proposal divides the UWB spectrum into at least three bands, and uses OFDM to create numerous, narrow channels within these, and to "hop" between them. "If you break up the spectrum into 500-MHz chunks, it sim-

## Head to head

**Two factions will joust at an IEEE task group meeting over development of an Ultra Wideband (UWB) standard to provide to high-bandwidth wireless links for personal-area networks.**

### Multiband

Backers	Technology	Status
36-member MultiBand OFDM Alliance (includes Fujitsu, HP, Intel, Nokia and Texas Instruments).	Subdivide UWB spectrum into smaller chunks, hopping between them to minimize interference; modulate with OFDM (as in the 802.11a and 802.11g WLAN standards) to improve transceiver sensitivity.	Backed by about 60% of IEEE task group voting members; needs 75% to be adopted as the basis for the 3a standard; MBOA plans to publish its specification in February and members expect to build products based on it for early 2005.

### Direct Sequence

Backers	Technology	Status
Motorola (and Xtreme Spectrum, now a Motorola unit), and Digital Signal Processor vendor Ceva (formerly ParthusCeva).	Divide UWB spectrum into two big chunks; modulate using a CDMA-like technique — direct sequencing spread spectrum — to give high performance for many users in a given band; resists interference well.	The Motorola/Xtreme UWB chipset was used by Samsung last week at the Consumer Electronics Show to transmit three HDTV video streams at the same time at 114M bit/sec, using less than 200 milliwatts of power.

### Waste of time?

"If we don't see any headway, I question how much longer companies will continue to send people," says Mark Fidler, senior engineering scientist with HP's imaging and printing systems group, and a TG3a participant. HP is an MBOA member. The Singapore meeting in September was a "complete and utter waste of my time," he says.

MBOA plans to publish its own UWB specification next month. Members will start building products based on that specification, says Stephen Wood, who oversees UWB strategy for Intel. "There's very aggressive work being done in MBOA," he says. "And upcoming announcements will reflect this."

Motorola won't sit idle either. "We need to work with the companies that need a [UWB] solution now, before a standard [is final]," says John Barr, director of standards realization for Motorola. "No MBOA members have a product they can give to customers to run and test."

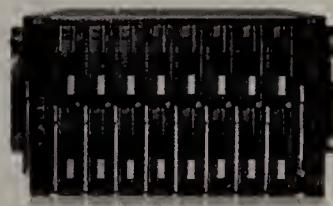
The IEEE could go ahead with both proposals, but that's not an idea that many like. "Two [physical] layers? That's a cop-out because we couldn't make up our minds," HP's Fidler says.

Heile, a veteran of IEEE battles, seems unruffled. "The folks on the 802.11g [WLAN] group fought like dogs for two years," he says. "We've only been at this for six months. We've got a ways to go." ■



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**WLAN**

continued from page 1

customers discussing migration strategies as "802.11i-upgradeable" access points start to hit the market in advance of the standard's completion.

"This is a huge issue right now," says Jon Allen, coordinator of IT security at Baylor University in Waco, Texas, which has a campuswide WLAN based on Enterasys Networks gear. "It's very important that with limited university funds we not get dead-ended with hardware."

Baylor wants to expand its WLAN campus network and still be prepared to adopt 802.11i security as soon as possible after the standard is approved. The older Enterasys R2 model of WLAN equipment that Baylor uses might be able to support 802.11i through a swap-out of radio and chipset, but it might not. Enterasys "can't guarantee it until the standard is set," Allen says.

This uncertainty is forcing Baylor into a wait-and-see approach as regards 802.11i, which uses the 128-bit government-sanctioned Advanced Encryption Standard (AES), approved by the National Institute of Standards and Technology as the replacement for the Digital Encryption Standard.

**Vendor warnings**

And this uncertainty is prompting vendors — which don't want to see the market for WLAN equipment dry up as everyone waits on the finalization of 802.11i based on AES — to explain their migration strategies.

Enterasys says its new model AP 3000, which is set to ship next month, will be based on more powerful hardware that can operate in "dual-mode" WPA/

**WLAN security advances****Here's how 802.11i improves upon the Wired Equivalent Privacy (WEP) and Wi-Fi Protected Access (WPA) protocols.**

- **40-bit and even 104-bit WEP can be broken through various brute-force attacks to determine the WEP key; 128-bit Advanced Encryption Standard in 802.11i is not known to be breakable.**
- **Flaws in WEP's key-scheduling algorithm allow for cracking keys and injecting packets into WEP streams; the Temporal Key Integrity Protocol (TKIP) in 802.11i is designed to improve key management.**
- **WPA, created in late 2002 by the Wi-Fi Alliance, adds TKIP to WEP as an interim fix for better security prior to 802.11i being finalized.**

WEP and 802.11i draft-compliant AES. "The chipsets of the older R2 were never made to support the type of key technology in 802.11i," says Jeff Manning, marketing manager for wireless at Enterasys.

Cisco and Intel, also big backers of 802.11i, agree that the emerging standard will require a new generation of WLAN equipment and that customers need to be aware of that.

"You want to install the access point once, not twice," says Duncan Glendinning, wireless program manager for Intel's mobile platforms group. "The change is the AES encryption, which takes a lot more computing power."

Intel — which uses WLANs extensively and is struggling with the same upgrade questions that Baylor has — is working to ensure future versions of its Centrino WLAN hardware are "802.11i-upgradeable," Glendinning says.

Cisco also has started educating customers on its 802.11i product plans.

"On the access point side, you'll need new radios or a whole new access point for good performance for 802.11i," says Chris Bollinger, product manager for Cisco's WLAN business. "And the new network interface cards will also have AES on board."

Though a time frame has not yet been announced, Cisco plans to include AES-based processors in the Cisco 1000 and 1200 WLAN access points before the 802.11i standard is finalized. Cisco will provide a way to activate 802.11i with these models once the standard is set. "In the Cisco product family, you could have several different security schemes on one access point," Bollinger says.

However, for customers that spent millions of dollars on Cisco WLAN equipment that supports WEP/WPA but not 802.11i, Cisco wouldn't necessarily advise swapping it all out for 802.11i, especially if used in retail sales or warehouse environments where worry about WLAN sniffing and cracking might be minimal. "If the highest level of support is WPA," Bollinger says, "that's not bad."

As 802.11i gets closer to being finalized, testing equipment for interoperability across vendor lines will become a bigger issue. The Wi-Fi Alliance and TruSecure's ICSA Laboratory are among the organizations planning to conduct such tests.

**PEAP problems**

Even if 802.11i turns out well this year, there are other simmering WLAN security issues that show no signs of cooling down.

Cisco and Microsoft over a year ago teamed on a client/server-based authentication protocol called PEAP (see [www.nwfusion.com](http://www.nwfusion.com), DocFinder: 9255). The goal was to include PEAP in WLAN gear as well as client software, authentication servers and online directories where an end-to-end authentication protocol was needed to approve user access to a WLAN. Microsoft and Cisco submitted the work done on PEAP to the Internet Engineering Task Force, hoping it would become a standard.

However, Cisco and Microsoft are now sharply split on what PEAP is supposed to be, with each supporting separate versions but confusing customers by still calling their own implementations PEAP.

"There are two flavors since Cisco and Microsoft PEAP haven't come together," says Kevin Walsh, director of product management at Funk Software, which has endeavored to support multiple WLAN security methods in its client/server authentication products. "The Cisco [PEAP] client can't be authenticated by the Microsoft server and vice versa."

"PEAP when it first came out, everyone said, 'This is it!'" Cisco's Bollinger says. "PEAP was defined in a fairly flexible way. It works much like your browser when you go to a Web page. PEAP uses Secure Sockets Layer under the covers, and you can encrypt from the client to the server and then authenticate."

But the flexibility in the model allowed for variants that have split Cisco and Microsoft in this area. Microsoft has supported its version of PEAP in Windows XP, Windows 2003 and Active Directory in a way that Cisco terms a "lock-in."

"It works great for Active Directory and NT domains, but doesn't work with [Lightweight Directory Access Protocol], Novell Directory, SecurID or one-time passwords," Bollinger says. "It works great for Microsoft databases and nothing else."

Cisco's version is broader, according to Bollinger. With its Microsoft alliance founders, Cisco has turned to Funk, Intel, MeetingHouse Communications and others to ensure its version of PEAP is supported in client software. Cisco also still supports an older proprietary protocol, Lightweight Extensible Authentication Protocol, specific to its own WAP and authentication server.

Microsoft declined to provide a spokesman on the issue of PEAP, but did answer questions via e-mail.

"Both companies support PEAP, but each with different methods of authentication," Microsoft wrote. "In comparing Microsoft's version and Cisco's version, we believe our implementation offers several important advantages." Among these would be a feature Microsoft calls "fast reconnect," supposedly a speedier method of authentication.

Microsoft's e-mail also said: "The Cisco approach is not an open standard and is available only from Cisco partners, potentially limiting future network infrastructure choices and potentially leading to higher long-term deployment costs."

Meanwhile, both versions of PEAP languish in the IETF without making any progress as a common standard. ■

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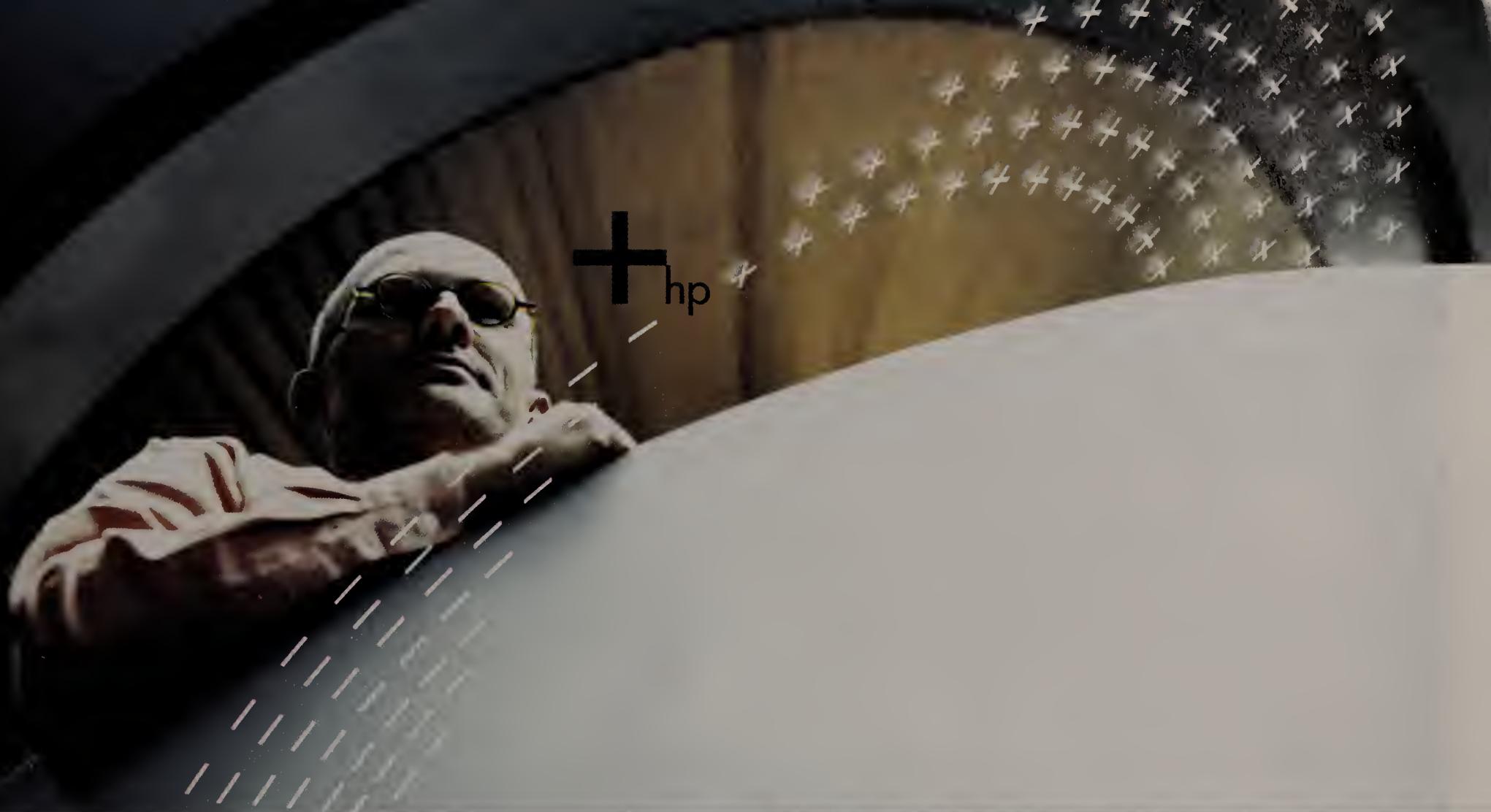
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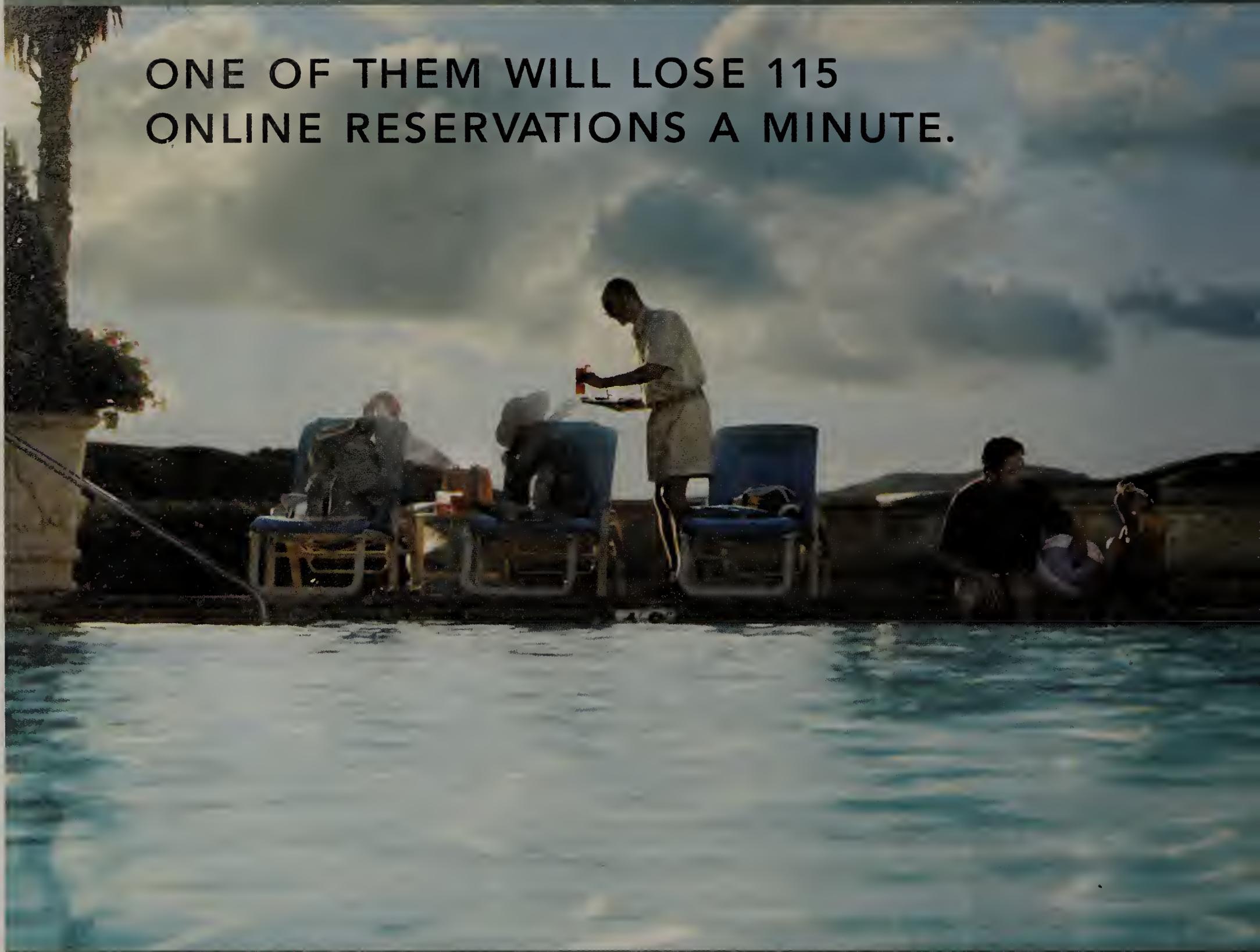
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# C&W service termination rankles customers

■ BY DENISE PAPPALARDO

Cable & Wireless America is giving customers reason for concern yet again as it tries to reduce its network size and drop customers.

The service provider — which filed for bankruptcy a month ago — is in the process of reducing its customer base by about 400 in 11 cities (see graphic). As of last month, the company said it had 5,000 customers.

This is the latest in a series of reorganizations, management changes and service discontinuances the financially strapped company started 18 months ago. C&W says the latest cuts are a result of its effort to focus on Web hosting and IP services.

C&W notified customers by mail last month that they had 60 days to find another service provider or be cut off by Feb. 13.

"When they're cutting off your service they should also send e-mails to be sure customers know as soon as possible," says one IT manager in Cleveland who asked to remain anonymous. Instead, this user scrambled one week before Christmas to find another carrier that could support a quick cutover.

"We just renewed our contract after we were assured [C&W] wasn't going to pull the plug. We

shouldn't have renewed," he says.

Meanwhile, C&W's message to customers is ambiguous and confusing. Although the letter says IP services will be discontinued in the 11 cities, a C&W executive says that's not the case.

"We have multiple nodes in Santa Clara. We are shutting down one of those nodes," says Xindi Wu, vice president of product management at C&W America. "We're shutting down 11 nodes." But in cities such as Austin, Texas, and Cleveland, where C&W only has one node, customers are left in the lurch.

"This was disappointing," says Brownlee Thomas, an analyst at Forrester Research. Although some users should not have been surprised, C&W didn't drop customers as thoughtfully as it should have, she says.

Some customers that buy complex Web hosting lost dedicated Internet access in some of these cities, she says. "That's just not smart," she says.

The company says its decision to turn off nodes and drop customers was made before it filed for bankruptcy.

"Has Cable & Wireless further lost creditability? Well, this certainly doesn't help," Thomas says.

While the service provider has been looking for ways to eliminate unprofitable nodes and,ulti-

## End of the line

**Cable & Wireless America sent this letter to about 400 customers notifying them that their IP service will be cut off in 60 days.**

**Dec. 13, 2003**

**Dear Customer:**

**Cable & Wireless America remains committed to providing exceptional value to the US marketplace, and we are continuing to evaluate our product & service offerings and network infrastructure in order to deliver the highest-quality services to our customers.**

**As you may be aware, certain of the Cable & Wireless America entities filed voluntary petitions for bankruptcy on Dec. 8, 2003. This disconnect notice is not being issued as a result of the bankruptcy filing. Rather, the company is continuing to operate in the ordinary course of business during its bankruptcy.**

**Based on this ongoing evaluation, we are consolidating our network to focus on Hosting and IP Solutions. While we continue to invest in flexible and secure IP connectivity and networking services, as well as our secure infrastructure, we are discontinuing IP services in the following locations in the US:**

Austin, TX  
Baltimore, MD  
Cleveland, OH

Kansas City, KA  
Metairie, LA  
Nashville, TN

Orlando, FL  
Portland, OR  
Raleigh, NC

San Antonio, TX  
Santa Clara, CA

mately, customers, it also is trying to significantly reduce the size of its network.

The company wants to shut off 5,099 circuits on its national network, according to documents

filed with the U.S. Bankruptcy Court for the District of Delaware. C&W leases these circuits from several carriers, including AT&T, MCI and SBC.

If the court approves the ser-

vice provider's request, C&W will nearly cut its network in half. The service provider's backbone consists of just over 12,000 circuits today.

C&W calls these 5,099 circuits "inactive" and says it will reduce its monthly expenses by \$1.8 million per month if it can eliminate these lines. The court is expected to rule on the service provider's request at the end of the week.

The company is trying to focus on high-end and complex Web hosting and get rid of much of its unused capacity. "It's trying to become profitable," Thomas says.

Dropping these circuits will not affect customers, Wu says. According to Wu, they do not carry user traffic. If that's the case, C&W has a significant amount of overcapacity.

Overcapacity contributed to the company's current financial condition. In early December, C&W struck a deal with Gores Technology and then filed for bankruptcy as part of that deal.

Gores is trying to buy C&W America for \$125 million. But first the service provider's assets will be auctioned at the end of the month to see if any other buyers are willing to pay more. Gores and C&W say they expect the deal to move forward and conclude by early February. ■

## Alumni

continued from page 1

modem," said Abraham, shaking his head and pointing to a full-blown Ethermodem on a nearby memorabilia table covered with mugs, photo albums and other tchotchkes.

Chipcom is one of many former network industry stars that lives on through an active alumni group. Others, from Alteon to Digital Equipment to Netscape, do the same. Groups also exist for companies that are still around, such as Lucent, that might have shed many employees over the years by one means or another.

The groups help keep former colleagues and friends in touch. On the Netscape alumni site, many former co-workers are still issuing salutes to a company that — as Mike (employee No. 335) put it, "changed the world." Others are still griping about how Microsoft or Sun or AOL ruined Netscape and turned working there into, well, work. "I'm tired ... tired of dragging myself to 'work' and dealing with the daily corporate drudgery," wrote one alum recently.

Aleks Totic, an early Netscape developer who started the site in 1998, says it gets about 20,000 hits each month and that 1,000 people have added their entry information on the site. "That's impressive considering that we've only had 3,000 alumni," he says. Traffic spikes when Netscape's Mozilla open source development offshoot makes news or when there are layoffs at what's left of Netscape within AOL, which bought the company in 1999.

Like these Netscape alums, former Chipcom employee Mlinarsky has clearly not forgotten her roots. She now heads a wireless network start-up called Azimuth that boasts a board of directors featuring former Chipcom CEO Rob Held and a board of advisors including Abraham, Chipcom's fourth employee and now the head of 40G bit/sec optical network company Mintera. What's more, Ilan Carmi, former vice president of engineering at Chipcom, is the company's lead venture capitalist and a board member.

Held says one reason former Chipcom employees — some of whom refer to themselves as "Chippers" and their parties as "Chipcom proms" — continue to stay in touch is that the company was really brought together during an 18-month period when it was without a CEO.

"People got used to making compromises across departments," he says. "It fostered a lot of trust among people and that never went away."

Another former network equipment maker, Alteon of Jumbo Frames fame, also lives on via an alumni group even though Nortel consumed the company roughly three years ago. One ex-Alteon employee who asked not to be named says Nortel's "dismemberment" of Alteon drew him and his former colleagues ever closer together, partly to stay in touch, partly to rip former Nortel's management team.

The Alteon alumni site was launched by Dan Tuchler, now a consultant, and a former colleague who registered a

domain name (see [www.nwfusion.com](http://www.nwfusion.com), DocFinder: 9260) for alums a few months after leaving Nortel but didn't quite know what to do with it. "We thought it might serve as a way to give people free e-mail accounts," Tuchler says.

Now the site serves to alert alumni to reunion events, at which tequila shots are commemorated in online photos, and keeps them up to date on which Alteon products are selling on eBay. And where else can you find the notorious "Ad we never used," which features a picture of a baby staring at a mother's breast and includes the words: "Did you ever think you could be this happy again?"

Perhaps the granddaddy of network industry alumni sites is Digital Equipment's, which launched in 1993, years before Compaq snapped up the struggling computer maker.

The site is actually a for-profit organization that features ads and sells merchandise such as sweatshirts.

"It's not a huge money maker; we just raise enough to stay alive," says Peter Koch, a 25-year Digital veteran who now runs the site. He says there are 7,000 alums in the site's database, with roughly one-third of them active at any time.

Koch says he gets inspiration to stick with the effort given the closeness of the Digital community, which still rallies in the hundreds for holiday and other reunion parties around the world. "[Founder] Ken Olsen established a culture in which people were given big responsibilities

and were held accountable. People don't forget that sort of thing, even this many years later," he says. ■



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**INFORMATION LIFECYCLE MANAGEMENT IS:** a strategy that uses people, processes and technology to store and tap critical business data throughout its lifespan of value.

**IN THIS EDITION:**  
*Pressured to better manage information assets, companies today need an overarching plan to prioritize business information based on its value to the enterprise. Many are turning to a new concept called Information Lifecycle Management as an innovative, end-to-end solution.*

## Making the Case for Information Lifecycle Management

**MAKE NO MISTAKE:** using information wisely can make or break your company.

Once a supporting player in the creation of goods and services, information today is the star of the show, acting as the linchpin to success for enterprises worldwide. And as the latest business applications provide new methods of organizing and managing information, innovative companies worldwide have placed the strategic use of information at the heart of their business models. These companies realize that if managed wisely, corporate information can yield rich nuggets of insight to help them create additional revenue streams and enhance existing lines of business.

"The ability to use and leverage information as a company to drive additional business is critical," says Mark Lewis, chief technology officer at EMC, based in Hopkinton, Mass. "For many companies, smart use of information has truly become a differentiator, particularly as technology provides companywide access."

But knowing that information is a vital strategic tool and being able to fully wield that tool are two different things. Business leaders may realize that they are sitting on a gold mine of knowledge, but they remain frustrated by their inability to harness the power of information. For many, the solution is taking the form of Information Lifecycle Management.

## OVERVIEW

Managing information wisely means finding a way to link and analyze the data that lies in disparate applications across the enterprise.

**"Information is much more interrelated, and people are more interested in that interrelation."**

—Ron Williams,  
senior manager at  
Earthlink

### CHALLENGES TO INFORMATION MANAGEMENT

There are a number of obstacles in the path of executives who seek to create and exploit an integrated flow of information throughout their companies. Among the challenges:

**Explosive Information Growth.** The vast majority of business information is online now, fueling explosive growth in the infrastructure that supports it. "I'm constantly hearing about how much information is growing as IT is integrated into the business process," says Mike Fisch, director of storage and networks at The Clipper Group, a consultancy based in Wellesley, Mass. Data reside in a variety of formats—the unstructured data found in emails and Word files, the structured information of databases and transactional applications—but tying together these disparate sources of informa-

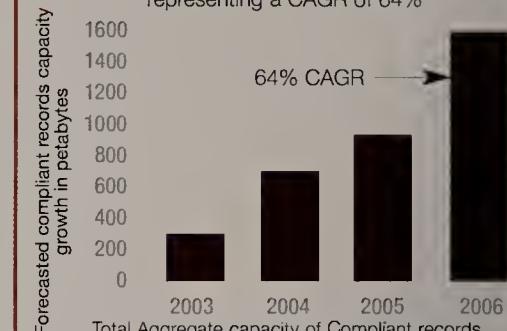
### SEVEN DEADLY SPEEDBUMPS

Here are the top 7 challenges to effective information management:

- Explosive Information Growth
- Cost Constraints
- Information's Strategic Value
- Perceived Strategic Value
- Regulatory Issues
- Fluid Nature of Information
- Perceived Business Value

### GROWTH STORAGE CAPACITY FOR COMPLIANT RECORDS

The capacity of compliant records will increase from 376PB in 2003 to 1,644PB in 2006, representing a CAGR of 64%



SOURCE: ENTERPRISE STORAGE GROUP, COMPLIANCE STUDY, MAY 2003

The need to meet compliance requirements will continue to grow, requiring methodologies and technologies to understand the value of information and how to manage it accordingly.

tion is a complex challenge. "Information is much more interrelated, and people are more interested in that interrelation," says Ron Williams, a senior manager at Earthlink, a \$1.3 billion Internet services provider based in Atlanta.

What's more, the growth of electronic data has spawned a whole new category of metadata: information about the data itself, such as who created it, who accessed it, where it's been and who's changed it. "It's an exponential feedback loop," says Williams.

**Cost Constraints.** Face it: companies have the difficult task of growing their informational infrastructure in a frugal cli-

### WORLDWIDE PRODUCTION OF ORIGINAL INFORMATION

(If stored digitally, in terabytes circa 2002)

Storage Medium	2002		1999-2000		% Change Upper Estimates
	Terabytes Upper Estimate	Terabytes Lower Estimate	Upper Estimate	Lower Estimate	
Paper	1,634	327	1,200	240	36%
Film	420,254	76,69	431,690	58,209	-3%
Magnetic	4,999,230	3,416,230	2,779,760	2,073,760	80%
Optical	103	51	81	29	28%
<b>TOTAL:</b>	<b>5,421,221</b>	<b>3,416,281</b>	<b>3,212,731</b>	<b>2,132,238</b>	<b>69%</b>

Upper estimates assume information is digitally scanned, lower estimates assume digital content has been compressed.

SOURCE: "HOW MUCH INFORMATION? 2003," SCHOOL OF INFORMATION MANAGEMENT AND SYSTEMS, UNIVERSITY OF CALIFORNIA AT BERKELEY

mate. Budgets are flat or rising just slightly, and CIOs are under severe pressure to drive every possible penny from their spending plans. "The ability to manage data costs is super critical," Williams says. Merely planning for growth can take up a hefty chunk of technical resources.

**Information's Strategic Value.** Cost and planning issues will not stem the relentless demand for better access to information. Businesses have grasped the undeniable strategic value of information and want that knowledge available in a seamless fashion. Bottom line: the access, availability and protection of mission-critical information are of vital importance.

**Regulatory Issues.** New government regulations such as Sarbanes-Oxley and the Health Information Portability and Accountability Act are throwing new wrinkles into the management of data, as companies face the risk of fines and legal action for noncompliance. "Regulations such as Sarbanes-Oxley are driving the need to be able to prove where data went [and] who accessed it, and then be able to bring it back to the state where it was last accessed," Williams explains.

As data become more interrelated, application-specific solutions to regulatory compliance won't get the job done, says Mike Kahn, managing director of The Clipper Group. "The problem is multi-application, as records can be in specific applications as well as in places like email."

**The Fluid Nature Of Information.** Information holds different business values over the course of its life and must be managed accordingly. This means that companies need to create processes that allow information to move about freely, as needed. "Information doesn't just move down in value," explains Steve Kenniston, a technology analyst with Enterprise Storage Group, in Milford, Mass. "Policies should dictate that data move up and down the storage food chain as business needs dictate."

At Earthlink, for example, Williams is building a tiered storage platform based on

### TOP PROBLEMS INFORMATION LIFECYCLE MANAGEMENT CAN HELP\*



\*According to 53 U.S. CIOs and Senior IT Executives

SOURCE: EMC RESEARCH GROUP FOCUS GROUPS JULY-AUGUST, '03

Information Lifecycle Management addresses many of the key challenges Senior IT executives believe they will face in 2004.

EMC technologies. "What EMC has been doing for a while is building the ability to move data that we need to access faster to storage that can deliver it faster and help migrate information," he says.

**The Business Value Of Information.** Understanding the value of information is at the heart of managing information, and that requires some forethought on the part of both the CIO and his line of business

"CIOs need to set up management policies that align with the value of information. Cradle to grave, it's a complex thing."

—Steve Kenniston,  
technology analyst,  
Enterprise Storage Group

### 5 ELEMENTS OF AN INFORMATION LIFECYCLE MANAGEMENT STRATEGY

According to industry experts, a successful Information Lifecycle Management strategy must be:

- **Business-centric:** This means that IT and business need to work together to align with key processes, applications and business initiatives.
- **Policy-based:** New government regulations like Sarbanes-Oxley and HIPAA mandate how long data must be retained, when it may be deleted and who has access to it—all perfect candidates for policy-driven automation. CIOs should tie information policies to automated tools that ensure policy enforcement.
- **Centrally managed:** To provide an integrated view of all of the business's information assets, both structured and unstructured, Information Lifecycle Management must be centrally managed.
- **Heterogeneous:** To operate throughout the entire enterprise, Information Lifecycle Management strategies must encompass all types of platforms and operating systems.
- **Aligned with the value of data:** A key aspect of Information Lifecycle Management is the ability to match storage resources to the value of business data at any given point in time. Once classified, Information Lifecycle Management matches infrastructure to the value of the data.

## OVERVIEW

## IMPLEMENTING INFORMATION LIFECYCLE MANAGEMENT

To understand how Information Lifecycle Management can work in real life, consider how information moves through the supply chain:

- Company XYZ receives an order for a new widget. Immediately automated tools tag the data according to preset, business-driven data policies, enabling the company to track and manage the information throughout its lifecycle.
- The data value at creation is high, as it remains during order processing, where many people access and use it to fill and ship product orders.
- After the order is shipped, the informational value drops, prompting Information Lifecycle Management tools to automatically migrate the data from a high-performance tier of storage to a lower cost level that takes longer to access.
- However, if the customer calls in with a claim about a year into the two-year warranty, for example, the Information Lifecycle Management tools, once again managed by value-driven policies, pull the product data back to a high level of storage so that customer service representatives and technical personnel can readily draw on it.
- When the warranty runs out, Information Lifecycle Management tools recognize the policies pertaining to the tagged data and automatically delete the information, thus closing out the lifecycle.

### QUESTIONS ABOUT INFORMATION LIFECYCLE MANAGEMENT?

If you've got any burning questions about Information Lifecycle Management—and how you can begin implementing such a strategy—send them to [ilm\\_questions@emc.com](mailto:ilm_questions@emc.com). We'll answer the most frequently asked questions later in this series.

peers. If companies want to manage information—and get it to where it needs to be in an automated format—they must first analyze and prioritize the business value that underlies the data.

"CIOs need to set up management policies that align with the value of information," agrees Kenniston. "Cradle to grave, it's a complex thing."

### BUILDING AN INFORMATION LIFECYCLE MANAGEMENT STRATEGY

Information Lifecycle Management is not a product but rather an innovative method of harnessing informational chaos. "Information Lifecycle Management is a strategy, and one that encompasses people, processes and technology," says Kenniston. Done right, Information Lifecycle Management is proactive and dynamic, and helps companies plan IT growth to match their anticipated needs.

"Information Lifecycle Management is the ability to provide companies with

universal access to information—the right information—and the most up-to-date and logical version across the enterprise," says Tanuja Randery, vice president for global strategic initiatives at EMC. "If companies want to access and use information to their business advantage, the only way they can do that is to have a universal, unified approach to both viewing and access."

At this early stage, industry experts are painting the picture of what Information Lifecycle Management looks like. "Information Lifecycle Management is a vision, but it's also a practical reality for the future," says The Clipper Group's Fisch. [See "5 Elements of an Information Lifecycle Management Strategy," p. 3.]

Yet Information Lifecycle Management is not something that can be implemented off the shelf, nor is it one-size-fits-all. CIOs must closely examine their organizational needs and craft a strategy that best fits their company. A big task, perhaps, but Information Lifecycle Management can—and should—be implemented in stages that greatly simplify the task. For example, customers can start by first migrating to an automated networked storage environment with tiers of storage to deliver varying price points and capabilities, then implementing data classification and management policies for key applications such as enterprise resource planning. In the end, by evolving to an enterprise-wide platform, corporations can manage corporate information across the entire enterprise.

**NEXT:** In the next part of this series, we'll explore information protection and recovery.

**EMC<sup>2</sup>** FOR MORE INFORMATION  
where information lives Visit [www.emc.com/ilm](http://www.emc.com/ilm)  
for an in-depth look at Information Lifecycle Management products, services and strategies.

# Infrastructure

■ LAN/WAN SWITCHES AND ROUTERS  
 ■ ACCESS DEVICES ■ SERVERS ■ VPNS  
 ■ OPERATING SYSTEMS ■ NETWORKED STORAGE  
 ■ VOIP ■ WIRELESS NETWORKS

## 3Com upgrades flagship switch

Switch 7700 improvements include redundancy, software security features.

■ BY PHIL HOCHMUTH

**Novell** last week announced that its Ximian Desktop software now supports SuSe Linux. **Ximian Desktop 2**, a product Novell acquired with its acquisition of Ximian last August, is based on the open source GNOME project and lets users deploy a Linux desktop in a mixed Linux/Windows environment. The new version also supports SuSe's Linux Desktop and includes OpenOffice, the GAIM instant-messaging client and Ximian Red Carpet configuration management software. The software includes a Web browser and browser plug-ins. Ximian Desktop 2 can be freely downloaded. A version of the software, which includes technical support, automated software updates, Java support, additional fonts and content plug-ins, is \$100.

**Dantz Development** has enhanced its back-up and restore software for Macintosh computers with the addition of support for Mac G4 and G5 computers running Mac OS X "Panther," Apple's latest operating system for Macintosh computers. **Retrospect 6.0** also now protects Apple's Xserve RAID storage devices and SCSI and Fibre Channel tape libraries. There now is no limit to the size of volumes that can be backed up, and backups to disk can span multiple FireWire or USB hard drives. The new version of Retrospect also supports tape libraries with more than 128 drives. Retrospect 6.0 is expected to be available this month for \$799 for 100 network clients and servers.

**Apple** last week introduced a new RAID array that will let users store as much as 3.5T bytes of data. The **Xserve RAID storage system** is contained in a 3U-high chassis and has 14 Advanced Technology Attachment drivers. It also supports Windows and Linux environments. The Xserve RAID subsystem connects to any Xserve or Power Mac using a 2G byte/sec Fibre Channel PCI adapter, which Apple sells for \$499. The RAID subsystem starts at \$6,000 for 1T byte of storage capacity.

3Com this week is expected to launch a version of its enterprise backbone switch offering users redundant hardware and new security software features.

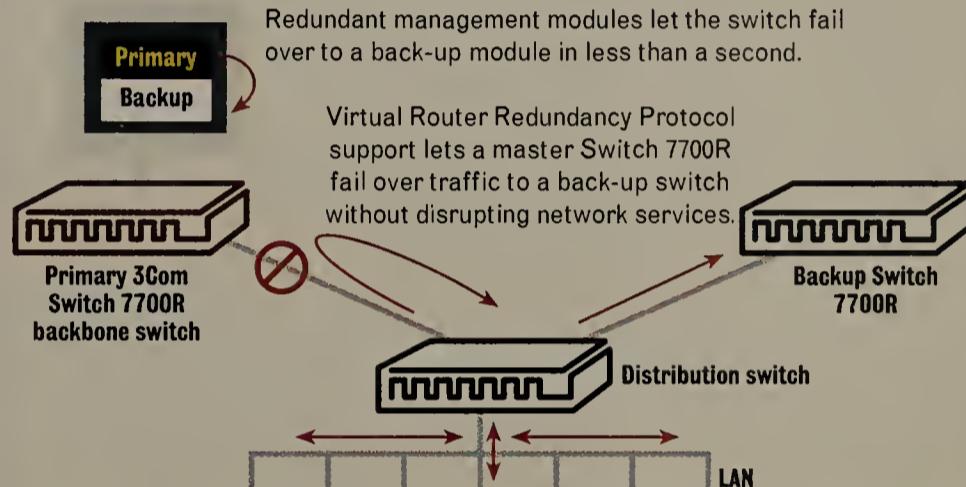
The Switch 7700R will include the option for installing dual redundant management modules, which will let the box fail over from one module to another in less than 1 second, according to the company. This capability is a key feature for deploying high-availability LANs and data centers, experts say. Meanwhile analysts say the new capability gives 3Com a truly competitive offering for large corporations.

The Switch 7700, announced last June, is a seven-slot, chassis-based switch that supports up to 96 Gigabit Ethernet ports and includes redundant power supplies. Missing was the important feature of management/switch fabric module failover, analysts say. The 7700R adds another slot to the original box, with seventh and eighth slots for redundant management blades. The redundant management modules run actively in parallel.

Previously, the only high-availability configurations for the Switch 7700 was to install primary and back-up Switch 7700

### Backup for backup

**3Com's Switch 7700R has the ability to provide subsecond failover inside the box, and failover to another device.**



chassis using Virtual Redundant Routing Protocol (VRRP), a router mirroring protocol that can take up to 10 seconds to re-establish services during a failover.

The Switch 7700R is being deployed at Prudential Northwest Properties, a real estate company with 19 offices around the Portland, Ore. area. It will act as the corpo-

rate backbone, plugging in all corporate resources, including 3Com's VCX IP PBX and unified messaging servers.

Having a backbone with dual, redundant switch fabrics was a key feature, says Sean McCrae, CIO for Prudential Northwest Properties.

See 3Com, page 18

## Alcatel beefs up switch mgmt. pack

■ BY PHIL HOCHMUTH

Alcatel this week is expected to release a version of its switch management software that promises to make managing network devices more flexible, secure and efficient.

The new version of Alcatel's OmniVista software product includes OneTouch capabilities for adding complex security policies and network configuration settings with a few mouse clicks. The software also can be used with non-Alcatel switches, the company says.

The new features in OmniVista are broken down into four modules:

- **Resource Manager** is a module that lets administrators create templates for updating network hardware configurations. The module lets users update hardware in batches across the network and also can be used to generate documentation on network upgrades. The software has a rollback feature that can revert switches to their original configuration.

- **Secure Access** is a policy management and enforcement component that can be used to set up network groups and configure the rights and access privileges of group members. The module relies on a Lightweight Directory Access Protocol database to track and maintain security groups. Policies such as access control lists and bandwidth allocation can be distributed to network switches through the software's desktop interface.

- **Trap Responder** and **Locator** tools can be used to set up alerts based on network events, such as detection of certain traffic patterns or other indicators. The Locator feature lets administrators track the source of a network trap to the physical port on a switch.

Alcatel also has certified the software to interoperate with Ethernet LAN switches from 3Com, Cisco and Extreme Networks. Alcatel users can use OmniVista to set up network traps, and Trap Responder and Locator features, and other basic manage-

ment functions on switches from the three certified third-party vendors.

Most switch vendors, such as 3Com, Cisco, Enterasys Networks, Extreme, Foundry Networks and Nortel offer management software for their respective switches with varying levels of features.

One analyst says the new OmniVista features appear to reflect user needs.

"Network management is more often an afterthought as opposed to forethought by network switch vendors," says Chris Kozup, an analyst with Meta Group. He says switch makers usually concentrate on "speeds and feeds" before developing advanced management applications.

"The new OmniVista [product] signals that Alcatel is getting some traction with its LAN products, and that they are listening to customers' concerns and executing on those concerns," he says.

OmniVista costs \$4,000 per license. Secure Access is an optional application that costs \$1,000 per license extra. ■

### Takes

## WIRED WINDOWS

Dave Kearns



**I**t's time to look back at what I predicted for 2003 and look ahead for the new year. I made four predictions for 2003, and I'm claiming partial credit. Specifically, I said (see [www.nwfusion.com/DocFinder/9230](http://www.nwfusion.com/DocFinder/9230)):

1. At the end of 2003, Microsoft still will be in court fighting the anti-trust suit.

It's still in court (with the Eolas and RealNetworks suits), so that's a partial.

2. Microsoft Office will begin to lose out to Web-based productivity packages offered as subscription services.

OpenOffice is gaining momentum, but not as a subscription service — MS Office is

closer to that. Again, I'll take partial credit. 3. The release of Windows .Net Server 2003 will spur an increase in Linux-based servers as customers scramble to use the hardware in which they've already invested.

Linux-based servers are increasing in numbers and market share, but not as quickly as some others predicted. I'll take full marks for this one.

4. Identity management emerges as the overwhelming security concern for networks and online services.

Maybe not overwhelming yet, but a significant change from previous years so I'll claim mostly full credit. I'd grade it 2.75 out of 4, not great but not bad.

Now let's go out on a limb for 2004.

1. Microsoft, faced with mediocre sales figures, will step up activity on the legal front not only with Eolas and RealNetworks, but also with anything that might tar-

nish Linux (such as the SCO debacle).

2. Speaking of SCO: Unless Microsoft invests very heavily in the company, expect huge losses and major changes in management and direction. No one will mourn.

3. Bolstered by activities at HP, IBM, Novell and Sun, Linux will become firmly entrenched in the enterprise server room. The extent of its penetration will be directly linked to the demise of SCO.

4. In the identity management sphere, privacy and user control of their own data will be the major topics. This concern will override the petty squabbling going on in the "federated identity" space among Microsoft, IBM and the Liberty Alliance as they patch over their differences to win market share.

Come back next year and see how well I've done. In the meantime, next up will be my choice as 2003's Networking MVP.

*Kearns, a former network administrator, is a freelance writer and consultant in Silicon Valley. He can be reached at [wired@vquill.com](mailto:wired@vquill.com).*

## Tip of the Week

**A**s a bonus prediction, I see 2004 as being the biggest year yet for **politics** and the **Internet**. From spam to speeches, wannabe office holders will spend more time online than in all previous years combined. We'll have to find some other place to escape them.

## Microsoft releases first public beta of Win 2003 for Opteron

■ BY JOHN FONTANA

Microsoft last week launched the first general public beta program for its Windows Server 2003 64-bit operating system designed for Advanced Micro Devices' Opteron chip.

The Windows Server 2003 64-bit Extended System preview is available only in the Enterprise Edition, which is slated for general availability in the second half of this year along with a Standard Edition. A Datacenter version is not in the works because no hardware manufacturer has committed to developing a system that would tune the operating system for a specific hardware platform, which is the way Datacenter is sold.

Microsoft has worked with AMD for nearly two years to develop the 64-bit operating system for its chips: Athlon on the desktop and Opteron on the server. The 64-bit platform processes more data per clock cycle, allows greater access to memory and speeds numeric calculations.

Similar 64-bit operating systems have been available on the Unix platform for years, and Microsoft is playing catch-up.

Last April the company released a 64-bit version of Windows Server 2003 for the Intel architecture and then promised to follow it up with support for AMD's chips. Last fall, Microsoft unveiled the first private beta of the Opteron-tuned software, which uses 64-bit extensions to the x86 instruction set to let users run 32- and 64-bit applications natively on the same chip.

That is in contrast to Intel's Itanium, which runs 32-bit applications in emulation mode.

"It appears that the Intel architecture has some performance issues when trying to run 32-bit code," says Dan Kusnetzky, an analyst with IDC. "AMD kept the 32-bit core and wrapped the 64-bit support around it."

Kusnetzky says the performance differences might be significant because 32-bit

code is the mainstay of Windows-based applications, and many vendors and companies might be unwilling to rewrite their code in the near term.

"We are excited about the AMD architecture because our install base of customers has a lot of 32-bit apps," says John Borozan, Microsoft product manager for 64-bit Windows Server. "You can double the amount of memory available to an application without having to modify it, so the AMD architecture provides a smoother migration path."

But Borozan says it is hard to make an apples-to-apples comparison of the AMD and Intel chip architectures.

Despite the 32-bit features of the AMD chip, Microsoft is warning users that the AMD-optimized platform is incompatible with 32-bit applications that have 16-bit in-

stallers, such as SQL Server 2000 SP3; applications that depend on the current version of the .Net framework; and applications that have 32-bit kernel-mode drivers, such as Exchange 2003.

Only a few 64-bit applications are compatible with the beta, according to Microsoft, including Computer Associates' eTrust Anti-Virus beta for AMD 64-bit and Microsoft's own SQL Server "Yukon" beta.

The 32-bit applications that are compatible include IBM DB2 Enterprise Edition 7.2, IBM WebSphere Application Server, Lotus Domino Server 6.0, J.D. Edwards ERP 8.0 and SAP R/3 4.7.

Last week's general release of the 64-bit Windows Server code for Opteron is the same code released to private testers last fall. Microsoft officials say the operating system is not feature-complete and updates to

the beta will be made available although there might not be another formal beta before final release.

Microsoft says Windows Server 2003, Enterprise Edition, for 64-Bit Extended Systems is only compatible with the AMD chip and will not install on Itanium-based systems. The beta can be installed on up to 10 computers. Microsoft also is creating a private newsgroup for beta testers to discuss technical issues.

Microsoft says the Enterprise Edition beta is well suited for large databases and line-of-business applications. It can support up to eight processors and 64G bytes of RAM.

The Standard Edition is targeted at high-performance computing clusters, Terminal Services and Active Directory data stores larger than 2G bytes. It supports up to four processors and 32G bytes of RAM. ■

## 3Com

continued from page 17

"Our network is maturing to a point where reliability is crucial, because of our wider use of applications such as unified messaging and voice over IP," he says.

"These features are things 3Com really needed to have to offer a true enterprise-class switch," says Zeus Kerravala, an analyst with The Yankee Group. Many corporations make redundant switch fabrics a requirement when putting out bids for network equipment, he adds. He says 3Com's previous high-availability option of running VRRP between two 7700s is a sound practice, but an expensive one.

"Some companies may not want to buy two switches for redundancy," he says. "A failover option inside the box is enough for some customers."

The Switch 7700R will compete with small backbone chassis such as Cisco's Catalyst 4500 and six-slot 6500 series, and

products from Extreme Networks, Foundry Networks, HP and Nortel. The Switch 7700 chassis is based on technology developed under 3Com's joint venture with Huawei Technologies.

Besides the hardware upgrade, 3Com also is releasing new software for the 7700 and 7700R that promises advanced security, management and routing/switching features for the backbone switches. Security features added to the box include SNMPv3. Experts say SNMPv3 is more secure than previous iterations of the protocol because it allows for tighter control of network management traffic, more accurate monitoring data and more flexibility in terms of deployment and administration.

Routing and switching upgrades in the software include Border Gateway Protocol Version 4 (BGP4) and the introduction of Multiple Spanning Tree Protocol, based on Rapid Spanning Tree Protocol.

BGP4 will give Switch 7700 administrators more routing scalability when deploying

the box in large-scale environments. On the LAN side, the Spanning Tree upgrade gives users up to 16 Spanning Tree domains that can implement across a single virtual LAN (VLAN). (Standard spanning tree allows only one domain per VLAN.)

3Com says splitting up VLANs into separate Spanning Tree domains could let networks that use VLANs extensively — for such applications as VoIP or wireless LAN segmentation — add more resiliency to these network segments. This beefed-up version of spanning tree lets 3Com's switch compete with switches from Cisco, Extreme, Foundry and Nortel, which offer similar VLAN/Spanning Tree capabilities.

The 3Com Switch 7700R starter kit — available at the end of the month for \$26,000 — includes an eight-slot chassis, a single switch fabric module, two power supplies and a fan tray. A back-up fabric module will be available for \$10,000. The Advanced Feature Software will be available for \$5,000 on Feb. 27. ■

# Middleware is Everywhere. Can you see it?



## Middleware

## Key

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2. Automatic shipping of sale.
3. Automatic identity verification.
4. Automatic updating of inventory.
5. Automatic tracking of delivery.

**MIDDLEWARE IS IBM SOFTWARE.** Powerful software like Tivoli® DB2® and WebSphere® Open, behind-the-glass technology that can automate it all – IBM, Microsoft®, Oracle, Sun. Problems are foreseen and solved before they occur. IT resources are directed to core business needs. Costs are significantly reduced. It's automation. On demand. And it's what keeps companies and customers happy. Very happy. **@business on demand™** at [ibm.com/software/automate](http://ibm.com/software/automate)

# Special Focus

**Servers:** IBM's iSeries.

## Venerable IBM server carries on

■ BY JENNIFER MEARS

**C**anadian customs broker GHY International was rolling out Intel servers en masse as it sought to keep up with its growth. The booming business was nice, but the multiplying boxes were becoming a monster to manage, says Nigel Fortlage, vice president of IT at the company in Winnipeg, Manitoba.

Like many companies, GHY was looking to consolidate. But it did so in a manner that might come as a surprise to some network executives. It folded its Intel servers into an IBM iSeries, the updated platform of the legacy AS/400 system that the company had run in its data center since the late 1980s.

"I'd heard IBM talk about all the things they were doing with the iSeries, but it never made sense because I could never connect it with my business mentally," Fortlage says. "It took IBM working closely with us for the light to finally go on. Now I know what it can do because I've lived it for a year."

What's unbelievable, Fortlage says, is the ability of the midrange box to support everything from Windows to open source to Web services. And IBM plans to invest more than \$5 million over the next two years in its iSeries line, aiming to increase the flexibility of the box to ensure it remains a key part of the changing IT landscape.

### Future moves

IBM says to expect the servers to support AIX — IBM's version of Unix — this year. That's in addition to support already available for Linux, Windows and, of course, OS/400.

"We have this concept of an on-demand operating environment, and what we're trying to create is a server that ultimately can run all the applications that a business needs," says Ian Jarman, product manager for the iSeries. "What we're focusing on is integration, virtualization and management of these operating systems so that you can share resources across AIX and OS/400, for example, and then automatically adjust the system and move capacity where you need it."

Other enhancements planned for this year include an upgrade to IBM's 64-bit Power 5 processor and a new 64-way system. The iSeries offers one to 32 processors today. As far as software goes, look for continuing ISV support for the iSeries platform, which currently runs more than 20,000 offerings from more than 4,500 software companies. For example, in the past year the number of Linux applications for the iSeries has grown from "only a handful" to hundreds "with more coming every month," an IBM spokeswoman says.

The biggest challenge for the iSeries, which has a dedicated following, is that companies that haven't deployed the box might question its strategic role in their data centers.

The iSeries, like IBM's mainframes, suffers because of people's outdated perceptions of what it does, says

Charles King, a research director at Sageza Group.

"But things have changed so radically in the last 36 to 48 months for both of those platforms with the emergence of Linux and some other things that the iSeries of today is a considerably different machine than the iSeries people might have thought of when they thought AS/400 even five years ago," he says.

At the end of 2001, with business growing, GHY's Fortlage didn't think to look at the iSeries as a means of taking up the burgeoning load. While the iSeries chugged along, running the company's core business application, Fortlage and his staff threw in Intel boxes one after the other to meet growing IT demand.

"With a team of three, we spent 90% of our time managing that environment," says Fortlage, who planned to increase the number of Intel servers from seven to 16.

Faced with the prospect of having to double his IT staff simply to manage all the boxes, something his company wasn't about to support, Fortlage last year huddled with IBM. At the time IBM was focusing on its small and midsize customers, and they figured out a way to reduce his management burden by giving the iSeries a greater role in the data center.

Fortlage ended up bringing in another iSeries and consolidated his seven Intel servers onto the boxes, which run Intel server cards to support Windows. He also is running Linux in 10 logical partitions within one of the servers.

"Within the two iSeries, I run my Windows servers, I run my Linux servers, I run my Dominoes servers. I run my core business applications on the iSeries," he says. "It's our firewall, our gateway, our DNS server. It's our mail server. And Linux on iSeries gives you a true enterprise-class machine.... To break that down in the Intel world, I'd be looking at 10 highly resilient redundant Intel servers, which get to be very expensive."

Fortlage says he spent about \$23,450 less bringing in the new iSeries than he would have spent deploying comparable Intel servers and is currently 14% under budget for the year. In addition, he has avoided the cost of hiring an additional three people to manage the growing number of Intel servers he would have had to deploy, he says.

### Server consolidation

Those kinds of savings stemming from consolidating Windows and Linux servers onto the iSeries aren't surprising given an IBM-sponsored study that IDC conducted last year. The study, which looked at six businesses — four manufacturing companies, a hospitality company and a services company — that used iSeries to consolidate x86-based servers, found an average ROI of more than 200% over three years. In addition, investment in the platform was paid back in about nine months and the companies cut downtime associated with Linux and Windows servers by 90%.

"Yes, the iSeries may have a high cost of entry [a low-end iSeries starts at about \$10,000], and the

**Power in numbers**  
According to IBM,  
more than  
**300,000**  
businesses run an  
iSeries server  
today.

### What's up with iSeries

**IBM's legacy AS/400 system, now called the iSeries, has evolved to be more flexible than some network executives might think. But challenges still loom for the niche server.**

#### Challenges:

- **Exposed roots.** The iSeries' AS/400 roots leave the impression that the system is capable of running only OS/400 applications.
- **Idiosyncratic.** The iSeries makes good on a promise to run multiple applications and operating systems on one machine, but that means users have to buy into the IBM vision.
- **Staying stable.** IBM is committed to evolving the iSeries to support new technologies, but it must keep the reliability and stability of the box intact.

#### Strategies:

- **Software support.** IBM says it will continue to work with ISVs to bring more applications to the iSeries.
- **Push reliability.** Stability and reliability of the server remain the focus for IBM even as it advances the iSeries to support new technologies.
- **Outline options.** In addition to supporting multiple operating systems, virtualization and logical partitions, the iSeries also offers capacity on demand so users can pay for extra processing power only when they need it.

high-end systems start at about \$1 million] but if you look at those costs over the total life cycle and include operational costs, ongoing maintenance of the system, it wins hands down," says Mike Shaw, iSeries operations manager at winery Kendall-Jackson in Santa Rosa, Calif.

Kendall-Jackson has been running an AS/400 since the mid-1990s, but earlier this year deployed an iSeries i870 in an effort to give its data center a boost. The i870 hooks into IBM storage via fiber and has significantly reduced back-up time, Shaw says.

### The bottom line

"The bottom line is the increase in availability to our user community is just short of phenomenal," he says. "What was taking me six hours to perform in terms of backup, we're now doing in just under two hours."

Lady Remington Jewelry turned to the iSeries when HP announced the end of life for its midrange server, the e3000. Al Karman, IT director at the direct marketer based in Bensenville, Ill., says the iSeries provides the reliability and stability he needed for his ERP package, while also offering flexibility that wasn't available with the HP server.

"The iSeries runs virtually any code you throw at it," he says. "We aren't locked into an offering. If it makes business sense to write RPG solutions, or Cobol or Java scripting or C++ this machine supports them all." ■



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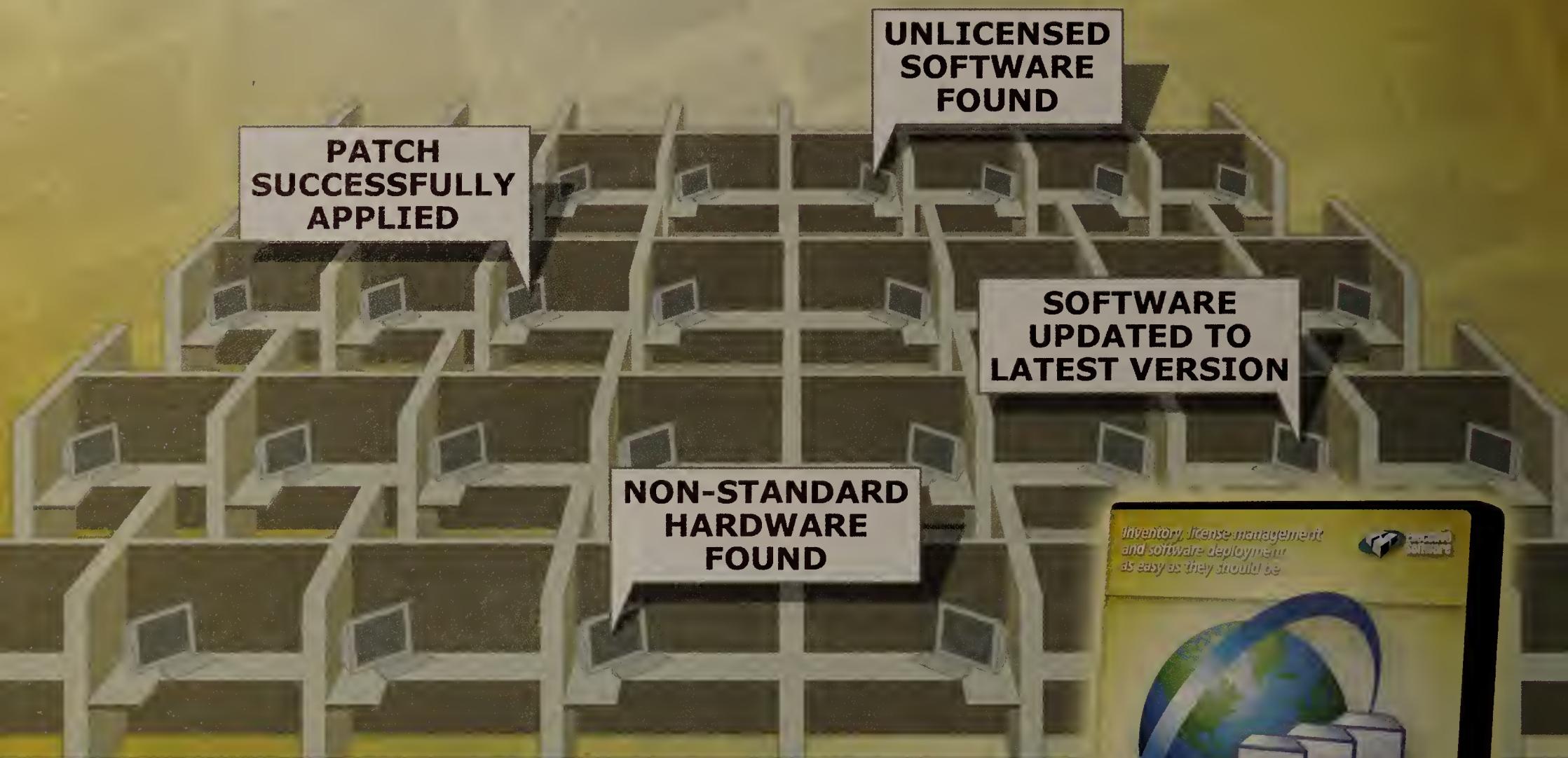
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# Enterprise Applications

■ PORTALS ■ MESSAGING/GROUPWARE  
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 ■ NETWORK AND SYSTEMS MANAGEMENT  
 ■ WEB SERVICES

## Short Takes

■ **GFI** has made available a freeware version of its **Network Server Monitor**, a tool that monitors a network and its servers to identify and fix failures. The freeware version lets users check availability of HTTP and Secure-HTTP sites and confirm whether the correct Web content is being served up and that a site has not been vandalized. An ICMP/ping function monitors whether a particular server is still responding. The freeware can be downloaded at [www.gfi.com/nsm/](http://www.gfi.com/nsm/) and includes access to a full version of the software for 60 days. After the evaluation period, only the HTTP and ICMP/ping checking features are available.

■ **Granite Systems** has released a client application that secures Mac OS X-based handheld computers on wireless LANs. The software, **WirelessWall Client for Mac OS X**, is a thin client and equips a device using OS X to work with the company's WirelessWall Policy Server and Access Controller product. WirelessWall lets network administrators centrally set up and manage WLAN access, intrusion detection, and other security features. It works with any 802.11-based access point and applies Advanced Encryption Standard cryptography at Layer 2, thereby protecting network addresses, ports and other lower-layer resources. The client incorporates Mac OS X devices into this security framework. It is part of WirelessWall and available at no charge to existing Granite customers. WirelessWall starts at \$1,550 for a 10-user license.

■ **Network Associates** last week announced **McAfee VirusScan PDA** enterprise, a version of its anti-virus software for Microsoft Pocket PC and Windows mobile devices. McAfee VirusScan PDA Enterprise can be managed via the same anti-virus management console — the McAfee ePolicy Orchestrator — that manages other versions of McAfee anti-virus software. Pricing is \$11.34 per 100 users.

## Users tackle Linux management

With the operating system growing in popularity, customers look for mgmt. help.

■ BY DENISE DUBIE

When Sean Lentner made the decision to move a dozen servers from Windows NT to the Linux server platform, he also had to consider changing how he managed those boxes. Specifically, the systems analyst at NYFIX, an electronic trading firm in Stamford, Conn., says he needed to find software that would let him manage the 12 Red Hat, Debian and Gentoo boxes alongside the 1,000 or so Windows servers in the network.

"Because we still have a lot of Windows servers, we needed to use something that would let us manage everything — monitor general aspects of the machines, distribute patches — from one console," says Lentner, who made the server switch about three years ago. "We couldn't risk shutting a server down or having a box act flaky, and we needed to have a solid management plan to apply to all servers."

Lentner made the switch to Linux to guarantee his electronic trading application a stable platform, but he also needed to ensure the operating system could be managed with his enterprise-class tools.

As more corporate users are considering Linux as a viable operating system, they are looking to vendors to provide better management tools to support larger Linux deployments.

A recent SG Cowen survey of more than 500 IT users found that 65% of respondents planned to increase their use of Linux within the next few years, including 29% of companies that have yet to deploy Linux. Today, Linux is used at more than 80% of the firms surveyed, with 72% using it on servers and 15% using it on the desktop. As far as server deployments go, Linux is used most at the Web access tier, although it also is starting to gain traction in database and application tiers, the survey found.

According to the survey, the move to embrace Linux is driven primarily by improved reliability and better scalability of the operating system, with companies opting not to deploy Linux saying that application availability, service and support concerns were holding them back.

Linux software vendors such as Red Hat, SuSe (acquired by Novell) and TurboLinux provide system-monitoring tools with the operating systems to help automate server management tasks. Linux hardware vendors such as Dell, HP, IBM and Sun provide

**See Linux, page 26**

## Lassoing Linux

Hardware and software vendors provide a variety of tools to provision new boxes, monitor server performance and maintain availability across Linux environments. Here's a sample of products:

Vendor	Product	Features
<b>Debian</b>	Package Management System	Manipulates packages or parts of packages; breaks up packages for transmission; and installs packages on remote FTP sites.
<b>Dell</b>	Dell OpenManage Server Assistant for Linux	Monitors hardware component health; manages remote servers; and integrates with management suites.
<b>HP</b>	Systems Insight Manager	Performs fault monitoring, configuration and workload management.
<b>IBM</b>	Tivoli System Automation for Linux	Discovers system resources; maintains availability to automate manual management tasks.
<b>Red Hat</b>	Network Management Module	Performs systems grouping; enables systems permissions; automated scheduled actions; and includes package profile comparison tools.
<b>Sun</b>	Sun Grid Engine	Distributed resource management and job queuing; and aggregates the compute power of servers and workstations.

## Netriplex spam service, money-back guarantee

■ BY CARA GARRETSON

Data hosting company Netriplex has jumped into the anti-spam market with a service that guarantees to keep unwanted messages from a company's in-boxes, or else it will reimburse customers \$1 per spam message received.

Called Netriplex E-mail Management Solution, the service, which became available last week, offers spam and virus protection through the company's hosted e-mail service.

Customers can choose to have only their incoming mail or both incoming and outgoing messages routed through Netriplex's nine data centers located around the country, says CTO Jonathan Hoppe. The company has roughly 100 customers using the service, including some large

corporations and ISPs.

The service uses approximately 10,000 homegrown algorithms to detect unwanted messages, and blacklists, whitelists and proprietary technology called SpamSig that the company won't yet divulge information on because it's applying for a patent.

It's unusual for an anti-spam vendor to claim 100% spam blocking while maintaining a zero false-positive rate. Instead, most vendors say there's a trade-off involved. For Brightmail to maintain its one-in-1-million false-positive rate, its software's effectiveness in catching spam messages hovers around 92%. Brightmail officials say its customers are more concerned with missing legitimate e-mail messages than with having in-boxes that

**See Netriplex, page 26**



reach



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# **SMOOOTH RIDE.**

'NET INSIDER'

Scott Bradner



# The Internet is not a railroad, or is it?

ber. The paper combines a history of transportation pricing with an exploration of which lessons from that history might apply to the Internet.

Odlyzko says the Internet might be an anomaly in the transport business because the cost does not currently depend on what is being transported. Many other transportation systems, including railroads and freight haulers, charge different rates for carrying different types of goods. ISP pricing does not take into account what is in the packets transported over the network. Surfing the Web, downloading music or watching a NASA telecast of the Mars landing all cost the same.

The Internet's basic architectural design assumed that ISPs just carried packets. ISPs didn't know what was in those packets and didn't care. But, as Odlyzko notes, there are now a number of reasons to think about changing this architectural assumption. These issues are more fully explored in a 2002 paper by MIT re-

searchers Dave Clark, John Wroclawski and Karen Sollins, along with USC researcher Bob Braden, called "Tussle in Cyberspace: Defining Tomorrow's Internet" (DocFinder: 9233). Some reasons that it might become important that ISPs begin to know more about what is going on over their networks include economic issues (for example, ISPs need to figure out a way to benefit from high-value traffic to improve their ability to be profitable) and regulatory issues (for example, law enforcement agencies feel they need to be able to wiretap Internet-based communications). Odlyzko and Clark et al. see significant conflicts going forward over these issues. These conflicts might result in an Internet far less open for innovation than the historical one.

One part of Odlyzko's paper that has gotten the most attention, at least on slash dot, is his observation that "essentially all major networking initiatives of the last decade, such as ATM, [quality of service], [Re-

source Reservation Protocol], multicasting, congestion pricing, active networks and 3G, have turned out to be duds." This might be a bit overstated. He is quite right that none of these technologies have turned out to be successful carrier-based customer services, but many of them (not including congestion pricing, active networks or 3G) have turned out to be quite successful within enterprise networks.

Odlyzko's papers tend to be clear, thought-provoking and annoying. Annoying in that they tend to poke holes in too many of my not-well-thought-through assumptions. Sometimes annoying is the right thing to be.

**Disclaimer:** The words "annoying" and "Harvard" do seem to show up in the same sentence rather often, but the above positive view of annoyance is my own.

*Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.*

**A**ndrew Odlyzko is at it again. He keeps putting out tenaciously researched papers that make it very clear that one "common wisdom" or another is fundamentally flawed. His latest target is the telephone industry assumptions about what types of technology to invest in.

While Odlyzko is at it, he describes a significant conflict between the architectural assumptions that brought us the Internet of today and the ability for the ISPs to make a living.

His most recent paper, "Pricing and architecture of the Internet: Historical perspectives from telecommunications and transportation" (see [www.nwfusion.com](http://www.nwfusion.com), DocFinder: 9232), was published last Decem-

## Linux

continued from page 23

management software to keep track of Linux boxes. But the move is on from Computer Associates and HP (with its Systems Insight Manager) to provide an all-in-one server management tool that brings Linux management data on the same screen with Unix and Windows monitors.

As Lentner puts it, "I think you get less ulcers" when you can watch all machines from one location.

In the past, he and his team used a lot of scripts and telnet sessions to keep track of Linux and other server status, but Lentner says the demands of NYFIX's e-business grew faster than his staff could work. Lentner decided to work with CA Unicenter Network and Systems Management software. He had been a customer of the company's software distribution tool and started using the enterprise management software to manage his heterogeneous network.

Because of the immediate nature of electronic trading and the number of small brokerage firms NYFIX supports, Lentner wanted to be able to apply patches to Linux servers that support a specific Internet

application on the fly without shutting down operations. He plans to migrate NYFIX's Windows-based trading tablet to Linux when more clustering options become available.

Jerald Sheets, senior Unix systems administrator at Our Lady of the Lake Regional Medical Center in Baton Rouge, La., refers to his 15 Red Hat Linux instances as a "Godsend" for the nonprofit hospital. He uses the operating system for DNS, Web and e-mail servers, and in that capacity, management isn't much of an issue. Yet Linux used in the wrong scenario can cause problems.

"If you need a database that will support a 100 million row table, don't choose Linux," Sheets says. "A full-table scan in that scenario on inadequate hardware will bring your application to a crawl and give Linux a bad name."

Another potential downfall for managing Linux is mixing and matching too many flavors. Multiple Linux distributions running side by side also can cause management glitches, says Rick Beebe, manager of systems and network engineering at the Yale University School of Medicine in New Haven, Conn. He says "Linux is Linux" is not the case. "There is a lot of ancillary details done differently" that can wreak havoc when trying to manage and maintain multiple Linux servers running different flavors of Linux, he says.

"You spend a lot of time hunting things down if you use different distributions, and it's just confusing," Beebe says.

Beebe runs Red Hat Linux on 12 production servers, and for the most part he can manage them manually with the help of an application called Webmin. He says now he doesn't see the need to use an enterprise management software tool for his Linux servers because he doesn't think the operating system is ready for data center deployments. ■

## Netriplex

continued from page 23

are 100% spam-free.

In the months that Netriplex has beta-tested its anti-spam service, the company has not experienced a single false positive or uncaught spam message, Hoppe says. That has led Netriplex to offer users \$1 for every spam message that eludes its service and winds up in an in-box, up to the monthly fee that the user pays for the service, he says. "A lot of our competition puts



**“A lot of our competition puts money into their algorithms, but they don’t work around the clock to perfect them.”**

**Jonathan Hoppe**  
CTO, Netriplex

money into their algorithms, but they don't work around the clock to perfect them," Hoppe says.

## Spam weeder

Netriplex's technology acts like human beings weeding spam messages out of their in-box, Hoppe says. "When you sit in front of your in-box each morning, you know exactly which [messages] are spam by who it's from and the subject line," he says. "We've really finally grasped that."

"It sounds too good to be true," says Matt Cain, an analyst at Meta Group, adding that it's difficult for computers to emulate human beings when deciding what spam is because people have different definitions of what they consider unwanted e-mail. ■

"I wouldn't say [what Netriplex] is doing is technically impossible, but no one else has done it."

One practice that Hoppe says sets Netriplex apart from other anti-spam service providers, such as FrontBridge and Postini, is when its service is only 99% sure that a message is spam, a set of manual filters are applied to make a final determination. It can take up to 30 seconds to apply these additional filters on each questionable message, which represent less than 1% of all messages

received.

However, Hoppe admits the service likely will misidentify some obscure newsletters as spam. He added that a company's e-mail administrator or users could leverage the included management tools to add such newsletters to whitelists of e-mails that should never be blocked.

Pricing for the Netriplex E-mail Management Solution starts at \$59 per month for inbound scanning of up to 35,000 messages. Additional messages beyond the 35,000 limit cost \$2 for every thousand. For larger companies, prices start at \$199 per month for up to 100,000 inbound and 100,000 outbound messages, with additional inbound messages costing \$1.75 per 1,000 messages and outbound messages priced at 75 cents per 1,000 messages. ■



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# Service Providers

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## Q&A

### Goodbye, Cisco; hello, Procket



*Six months after losing its CEO, router start-up Procket Networks has landed a new one: Roland Acra, formerly Cisco's senior vice president and Service Provider CTO. Acra, who reported to Cisco Chief Development Officer Mario Mazzola, jumps to*

*Procket as Cisco keeps the industry waiting for its next-generation high-end router and operating system. On his first day at his new job, Acra shared some thoughts with Network World Managing Editor of The Edge Jim Duffy.*

#### What attracted you to Procket?

The team, first and foremost. It's a great bunch of people, a very strong networking team. A great technology, great products that are out there shipping. All of the technology risk was now removed from the product despite the very cutting-edge nature of what has gone into the product in terms of silicon innovation and next-generation operating system structures.

The timing was right. Over the next 12 to 18 months there will be an upswing in the market for high-end routers. So being there now and building the sales momentum and focusing on the sales effort is good timing.

#### How did you view Procket while you were working at Cisco?

I had the view that they had, by far, the best available technology on the market today. So when it came to technology edge — in terms of performance, density, structural reliability, in terms of what software and hardware architecture underlies the product — the level of silicon integration and innovation is absolutely unique. This is not a feature which somebody else can do in 60 days and say, 'me too, I've got it now.'

Just about everyone I have talked to [at Procket] is the best that there is in the industry — the software folks, the hardware folks, the architects.

#### Is Procket doing anything technologically that Cisco should emulate?

Procket [which was founded in 1999] is building its product on a few key premises, which are going to be the definition of what next-generation routers are about: One is a very advanced level of silicon integration, and a combination of speed and feature capability. The integration is important because through the integration into custom chips, you get a lot of savings passed on to the customer. You get a lower price point because of your cost of goods reduction; you get lower power dissipation; you get better density and space usage. And then the ability to have feature programmability at the same time as wire-speed performance means that you're protected against any new demand your network will place on you in the future.

On the software side, where Procket has written the

book is in developing the most modular and cleanly designed operating system. The compartmentalization of the different protocols makes for not only a very reliable system, but also for the best cycles of time to bug fix, add new functionality, or reduce downtime every time you're considering a planned event on the network — such as an upgrade — or an unplanned event, such as a bug that you need to address.

#### Did any frustration at Cisco with either the pace of technology development or organizational structure prompt you to leave?

No, my leaving was entirely a pull model as opposed to a push. I didn't leave as much as I came to Procket.

#### It has been reported that one of the challenges internally at Procket is in working with the founders, including Chief Scientist Tony Li. How closely did you work with Li when the two of you were at Cisco?

I worked with him a lot back when I was with Cisco in Europe. I was building the technical field organization at the time. So I was facing the customers, designing IP backbones and [Border Gateway Protocol] routing designs, and Tony would be one of the guys who would be, despite nine hours of difference, on his e-mail answering my questions and helping me through it. We stayed great friends since then and he was, by the way, one of the initial folks who felt me out and approached me about Procket to see if I was interested. I'm very excited to be back working with him. ■

## DISA names winning bidders

■ BY JIM DUFFY

The Defense Information Systems Agency has announced the winning bidders for the agency's Global Information Grid-Bandwidth Expansion network.

GIG-BE is a \$900 million effort to upgrade DISA's network with optical, Ethernet and enhanced security technologies.

Under "indefinite-delivery, indefinite-quantity" subcontracts to prime contractor SAIC, Ciena will supply GIG-BE's optical transport systems; Sprint and Sycamore Networks will provide optical digital cross-connects; Juniper will supply edge and core routers; and Qwest and Cisco have won the multi-service provisioning platform piece of the contract. ■

## Short Takes

■ Industry heavyweights have joined to define a standard for sending high-speed data and video traffic over existing coaxial cable that connects to televisions in most homes. **Cisco, Comcast, EchoStar, Matsushita Electric, RadioShack and Toshiba** have formed the **Multimedia Over Cable Alliance** to work on the specification. The alliance is building on technology from start-up **Entropic Communications** to develop a standard that is expected to support transmission rates from 100M to 270M bit/sec. Competing technologies would include Wi-Fi and those designed to

exploit existing phone and power lines.

■ Broadband equipment maker **Redback Networks** last week announced it has exited from Chapter 11 bankruptcy protection, having shed approximately \$467 million of its existing debt and eliminated \$44 million from its expense model. The company, which was founded in 1996, announced plans in November to restructure itself under Chapter 11 after a third-quarter loss of \$18.1 million.

■ **Advanced Fibre Communications** last week said it signed a definitive agreement to acquire Marconi's North American Access business unit for \$240 million. The deal expands AFC's

optical access portfolio with Fiber-to-the-Curb and digital-loop carrier equipment. AFC already sells Fiber-to-the-Premises equipment, such as central-office and premises optical electronics gear known as "active" elements.

■ **SBC** last week acquired privately held network consulting company **Callisma** in an effort to broaden its managed service portfolio for enterprise networks. Terms of the deal were not disclosed. Callisma has 125 employees, all of whom will be retained by SBC, says a spokesman for the carrier. SBC recently stated plans to bolster its presence in enterprise networks as it gains approval to offer long-distance services throughout its region. ■

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## EYE ON THE CARRIERS

Johna Till Johnson



## 2003: A forecasting report card

**O**nce a year, we pundits earn our chops by reviewing the predictions we made last year and seeing how well they stood up. Here goes.

Prediction No. 1: The Bells win on

unbundled network element pricing.

Actual result: Pretty much. FCC Chairman Michael Powell's decision pleased no one — it didn't allow for totally unbundled rates but pushed the regulatory job back

on the states, supporting the Bells' stranglehold on competition.

Predicted corollary effect: Tepid growth for the Lucent and Nortels in 2003.

Actual result: Yep. Both companies, in fact, experienced modest growth for most of the year, rising strongly toward year-end.

Prediction No. 2: There will be at least one more high-profile bankruptcy or merger in the telecom market.

Actual result: Tough call. I can claim the point on a technicality, because Cable & Wireless' U.S. operations entered bankruptcy last month, ending the U.K. provider's dreams of becoming a true global player and marking the demise of the high-profile hosting facilities Exodus and Digital Island (both of which C&W had acquired). But the bigger trend was the news of carriers on the mend, with both Global Crossing and MCI finally emerging from Chapter 11. I'll award myself the point, but note that the situation has definitely improved.

Prediction No. 3: Spending will rebound slightly.... This trend favors Cisco and other packet technology providers.

Actual result: Solid hit. Cisco's stock started on a consistent upward trajectory in April and had more than doubled by year-end. No surprise: Carriers and corporations have told me they plan to increase their investment in packet technology.

Prediction No. 4: VoIP continues to make slow and steady gains in corporations.... Folks begin to reap savings because of lower moves-adds-changes costs.

Actual result: Yeah, baby! The only word I'd quibble with in hindsight is "slow." IT executives are beginning to deploy IP telephony en masse — more than 80% of folks we spoke to in a recent Nemertes benchmark said they had either rolled it out or were planning to shortly — and we now have solid data demonstrating hard-dollar savings in operational cost reduction. (Check out our findings at Network World's upcoming VoIP Technology Tour at [www.nwfusion.com](http://www.nwfusion.com), DocFinder: 9237.)

Prediction No. 5: Wireless continues to boom, but nobody figures out how to make money on it.

Actual result: Another solid hit. Roughly three-quarters of IT executives who participated in a recent Nemertes benchmark indicated they'd already deployed Wi-Fi, and another 18% said they planned to. Only 8% said they had no plans to do so. And we're beginning to capture good, hard-dollar data on how these deployments are increasing their companies' productivity.

Prediction No. 6: Both the Bells and the cable companies continue to miss the boat on the emerging home networking market.

Actual result: Well, yeah. But betting on telco (and cable company) cluelessness is always safe.

Stay tuned for my 2004 predictions.



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Johnson is president and chief research officer at Nemertes Research, a leading independent technology research firm. She can be reached at [johna@nemertes.com](mailto:johna@nemertes.com).

# Technology Update

■ AN INSIDE LOOK AT THE TECHNOLOGIES AND STANDARDS SHAPING YOUR NETWORK

## SMI-S unifies SAN management

■ BY TONY DICENZO

Storage management is taking a major step forward with completion of the first version of the Storage Networking Industry Association's Storage Management Initiative Specification.

Until now, network managers looking after multivendor storage-area networks (SAN) have required a range of independent management applications, developed by a number of different vendors and tied to multiple hardware management APIs, to keep their systems running effectively. SMI-S is the first step in SNIA's effort to ensure that all storage systems will work together.

SMI-S is essentially middleware that sits between managed objects and managed applications. For storage network managers, six features of SMI-S will dramatically simplify SAN management:

- One common data model: SMI-S is based on Web Based Enterprise Management (WBEM) technology and the Common Information Model (CIM). SMI-S agents interrogate a device, such as a switch, host or storage array; extract the relevant management data from CIM-enabled devices; and provide it to the requester.

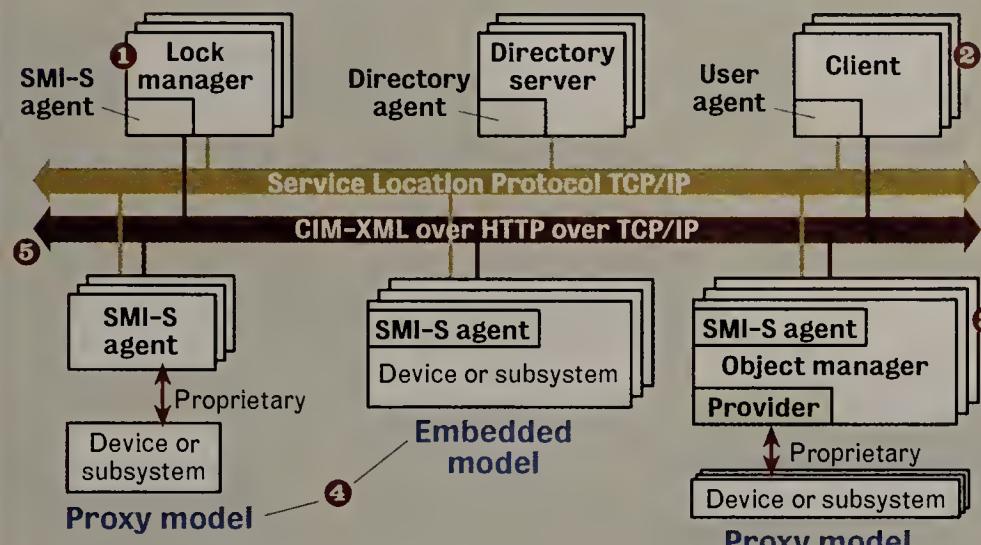
- Interconnect independence: SMI-S eliminates the need to redesign the management transport and lets components be managed using in-band or out-of-band communications, or a mix of the two. SMI-S offers further advantages by specifying the CIM-XML over HTTP protocol stack and utilizing the lower layers of the TCP/IP stack, both of which are ubiquitous in today's networking world.

- Multilayer management: SMI-S has

### ■ HOW IT WORKS

#### SMI-S

The Storage Management Initiative Specification simplifies the complexity of managing storage networks.



- ① Through the use of a lock manager, clients will be assured their actions are isolated from changes by other client operations.
- ② Components take on the role of a requester or provider of CIM-formatted information.
- ③ A CIM object manager provides management information, possibly from multiple devices.
- ④ Agents extract CIM information from devices and provide it upon request.
- ⑤ SMI-S uses the protocol stack of CIM-XML, which runs over HTTP, which in turn is carried over TCP/IP.

been developed to work with server-based volume managers, RAID systems and network storage appliances, a combination most storage environments currently employ.

- Legacy system accommodation: SMI-S has been developed to incorporate the management mechanisms in legacy devices with existing proprietary interfaces through use of a proxy agent. Other devices and subsystems also can

be integrated into an SMI-S network using embedded software or a CIM object manager.

- Automated discovery: SMI-S-compliant products announce their presence and capabilities to other constituents. Combined with the automated discovery systems in WBEM to support object model extension, this will simplify management and give network managers the freedom to add components to their

SAN more easily.

- Policy-based management: SMI-S includes object models applicable across entire classes of devices, which lets SAN managers implement policy-based management for entire storage networks.

SMI-S offers substantial benefits to users and vendors. With SMI-S, developers have one complete, unified and rigidly specified object model, and can turn to one document to understand how to manage the breadth of SAN components. Management application vendors are relieved of the tedious task of integrating incompatible management interfaces, letting them focus on building management engines that reduce cost and extend functionality. And device vendors are empowered to build new features and functions into subsystems.

SMI-S-compliant products will lead to easier, faster deployment and accelerated adoption of policy-based storage management frameworks.

A test suite developed by the SNIA will certify compliance of hardware components and management applications with the specification. Certified components also will be subjected to rigorous interoperability testing in an SMI laboratory.

SMI-S is being submitted to the ANSI's International Committee for IT Standards and is expected to receive a blessing from these organizations next quarter.

*Dicenzo is director of industry marketing at Brocade Communications Systems. He also is a member of the board of directors of the Storage Networking Industry Association and vice chair of the Storage Management Initiative. He can be reached at [tdicenzo@brocade.com](mailto:tdicenzo@brocade.com).*

## Ask Dr. Internet

By Steve Blass

**Can I share one of my Windows applications from an XP workstation with other Windows computers over the Internet?**

One way to do this is to use the Remote Desktop features in Windows XP by enabling the "Allow other users to connect to this computer" feature under the Remote tab of the System applet found in the Control Panel. Then Windows computers with the remote desktop client can connect and

log on to your XP machine over the network. You can download the client software for older versions of Windows by going to [www.nwfusion.com](http://www.nwfusion.com), DocFinder: 9234. Once installed, you will find the remote desktop client under the Communications section of the Accessories menu. Another way is to use the VNC package, available at DocFinder: 9235, under the GNU public license. To connect to the remote desktop with either method, run the client application and enter the remote host name

or IP address. Once logged on, you have a copy of the remote desktop in a window on your PC. VNC offers cross-platform support. A browser-based offering is available from DocFinder: 9236, which delivers the remote desktop connection through a standard HTTPS SSL connection.

*Blass is a network architect at Change@Work in Houston. He can be reached at [dr.internet@changeatwork.com](mailto:dr.internet@changeatwork.com).*

# QoS is Only Part of the Solution

By Larry Stein

When it comes to managing application performance over a wide area network (WAN), IT managers face conflicting demands from end users and upper management. End users need—and demand—fast response times. At the same time, CIOs must live within existing budgets and WAN spending is already one of the top three items in a typical IT budget. And as companies become more global, applications such as ERP, VoIP and storage over IP are landing on the WAN—placing even greater burdens on existing capacity.

## Key QoS Components:

- Next Generation compression increasing WAN capacity
- Essential QoS to prioritize traffic and allocate bandwidth
- TCP optimization to accelerate application response times

"We talk to many companies in the global 2000, and every one of them have constrained WANs," says Peter Firstbrook, a senior research analyst at META Group. "It's imperative to do some sort of QoS, mostly at the border of the LAN and the WAN."

Traditional QoS solutions make the most of limited WAN capacity by prioritizing one application ahead of another. These solutions do not create more capacity but rather ration the existing resource according to set prioritization rules. As a result, the software creates 'winner' and 'loser' applications, resulting in performance degradation for the latter class, along with user unhappiness.

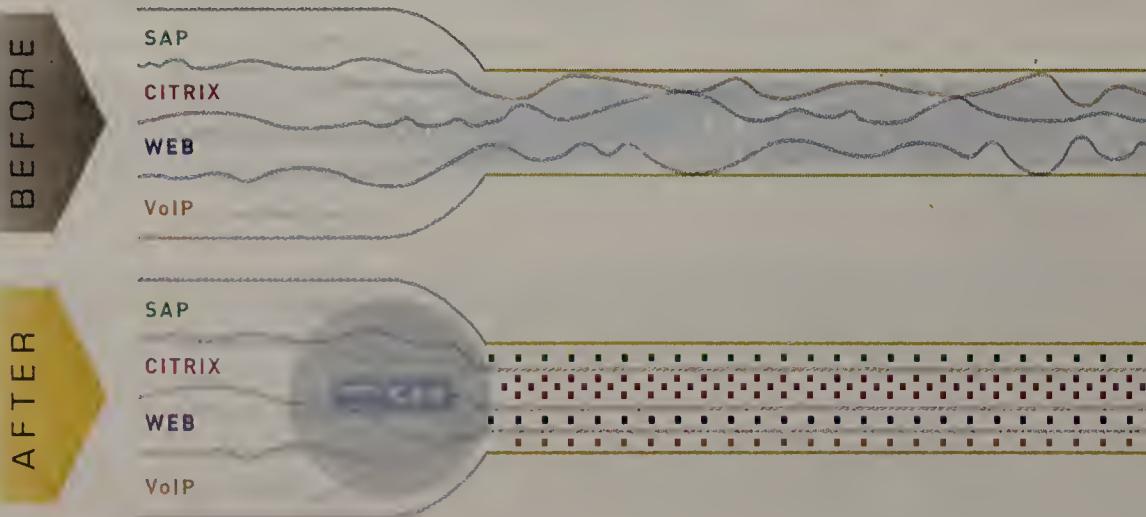
"It's not just a technical problem, it's a business level problem," points out Firstbrook. "Which application owner is going to stand up and say, 'Squash me, everybody else is more important than my application?'"

A new approach to QoS is embodied by companies such as Peribit Networks, which combine next-generation data compression technology with QoS prioritization software. "I'm bullish on the technology—I think it's good," says Firstbrook. "One of the reasons I do like companies with this technology is because they create bandwidth."

Peribit breaks the traditional limitations of QoS solutions by providing both dramatically increased network capacity and then easily managing this new found bandwidth to support optimal application performance. The result: Businesses can get more work done, faster. And that's truly the bottom line.

## Breaking the QoS Zero Sum Game

Next generation compression creates additional WAN capacity allowing essential QoS features to prioritize traffic without compromising application performance. This new-found capacity eliminates the winner-loser tradeoffs associated with traditional QoS solutions.



## On The Front Line With QoS

As CTO of law firm Fenwick & West LLP, Matt Kesner understands the need to provide far-flung operations with technology that allows them to reach peak performance. For Kesner, this translates into making sure that he can provide optimal application performance across all five office locations scattered across the United States.

Fenwick & West maintains a document library system with 27 terabytes of information essential for law research. Unfortunately, this application was a bandwidth hog for branch office users, who tended to open a connection and leave it open all day. Moreover, all email was routed through the main office to branch locations, which clogged WAN traffic further.

"Our applications generated significant traffic loads utilizing all of our existing network capacity," says Kesner. "We faced an expensive network upgrade."

Kesner was just about to bite the bullet and upgrade to a DS3 connection when he heard about Peribit Networks, a Santa Clara, Calif.-based company that makes next generation data compression and Quality of Service (QoS) appliances. "We decided to try it out, and we've been using it ever since. Peribit does a great job for us," he says. "We get about 6.5 times more capacity than we would otherwise, as well as the ability to closely manage traffic types like web browsing."

To learn more about QoS  
and bandwidth optimization,  
go to

[www.peribit.com/qos](http://www.peribit.com/qos)

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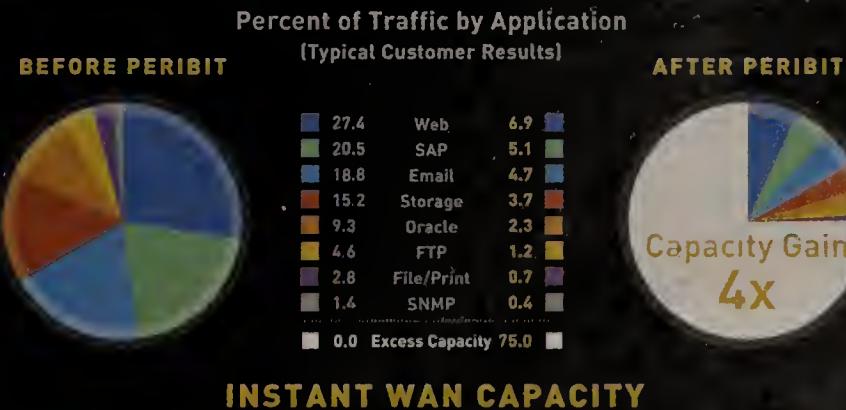
# WAN got you down?

## PERIBIT BREAKS TRADITIONAL QoS LIMITATIONS

Peribit breaks the traditional limitations of QoS solutions by providing both dramatically increased network capacity and easy management of this newfound bandwidth to support optimal application performance. The Result: Businesses get more work done without increasing carrier spending. And that's not a let down.

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**GEARHEAD  
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Mark  
Gibbs

**H**ere we are, just having crossed the threshold of a new year — renewed, re-inspired and dreaming of the Nasdaq hitting anything north of 4,000. Before we launch into our first geeky topic of 2004, we'd like to ask you for some feedback and guidance.

In all the reader surveys *Network World* has conducted, Gearhead has consistently scored very high. This, we conclude, means that we are doing something right. But we want to ensure that we carry on this winning streak, so we'd like you to write in and tell us what you want us to cover.

Do you want more overviews of network and related technologies, or do you want more detailed bits and bytes about what goes on under the hood? Do you want to see more programming-type tutorials? What technologies would you like to see us examine? Do you want more product reviews? And with the increasing use of Linux, would you like to see more discussion of the system's details and tech-

## Happy New Free Tools

niques and related products?

Please drop us a line to let us know what is on your plate and on your mind.

### Email Extractor

To begin this week we have a neat free-ware tool written in JavaScript called Email Extractor Lite (details at [www.nwfusion.com](http://www.nwfusion.com), DocFinder: 9238) written by Benjamin Leow. The tool, which requires Microsoft's Internet Explorer 4+, is used to strip out e-mail addresses from blocks of text, removing duplicates and returning the addresses in a comma-separated list (you can specify the use of any separator you like).

The script is embedded in a Web page that you save and load from a server or your local drive. You simply paste the input text block into one field, select the options you want, click on the extract button and copy the result from the output window. The total number of extracted addresses are displayed, and you can group addresses in blocks of whatever number you like, with each group separated by a new line. You can even have the addresses sorted alphabetically and optionally extract only addresses that contain specific text.

All this in a 2.87K-byte download! We

used it to create an address list from almost 6,000 messages stored in an Outlook folder. We exported the messages as a text file, opened the resulting 6M-byte file with Windows Notepad, copied the first megabyte of text from the file and pasted it into Email Extractor Lite. You have to limit the amount of text you place in the input field or ugly locking-up things can happen under Windows.

We pasted the results into another Notepad file and repeated the process five times until we'd processed all the text. We then copied all the extracted text back into Email Extractor Lite and processed it again to remove any duplicates that might exist because of breaking the original file into several parts. We wound up with a list of 785 unique addresses totaling about 19K bytes.

Note that when you run Email Extractor Lite with any sizable amount of text, Windows will most likely announce that "A script on this page is causing Internet Explorer to run slowly. If it continues to run, your computer may become unresponsive. Do you want to abort the script?" And it is true — on our 1.8-GHz Pentium 4 based machine running Windows XP, processing 3M bytes of text pushed the CPU utilization to 100% for so long that our

clothes were going out of style.

### The Yak

We also stumbled across another very cool tool: the Yak (see DocFinder: 9239), possibly the best Java-based button applet we've ever seen.

This 7K-byte applet, which is used to present sexy animated buttons on Web pages, is incredibly powerful. You can configure it to always show a sequence of images or do so only on mouseover or mouseout. You can use up to 100 images and set the animation speed. And you can create a button that uses only a single image or one that presents a traditional two-state toggle animation.

The Yak also supports sound, allows for various layout presentation styles and lets you select text font and style specifications. When the button is clicked it can load the link in the same window, a new window or a frame. And it is fast! The animations are smooth, the sound delivery clean, and it works with both Netscape and Internet Explorer.

And did we mention it is free? What a great utility!

Come on, tell us what you want at [gearhead@gibbs.com](mailto:gearhead@gibbs.com).

## Cool Tools

Quick takes  
on high-tech toys

By Keith Shaw

about \$40 per month and optional voice plans with varying prices. For more details, go to [www.nextel.com/blackberry](http://www.nextel.com/blackberry).

### Fujitsu launches new Tablet PC

Fujitsu's Computer Systems division last week began shipping its newest tablet. The Stylistic ST5000 Tablet PC is a slate-style version that has higher performance, security and screen enhancements, the company says.

The tablet has a brighter, 12.1-inch XGA display, weighs less than four pounds and is less than 1 inch thick. It is powered by an Ultra Low Voltage Intel Pentium M processor and includes a standard battery that should offer up to five hours of computing time. An optional high-capacity battery will offer up to eight hours of battery life, Fujitsu says.

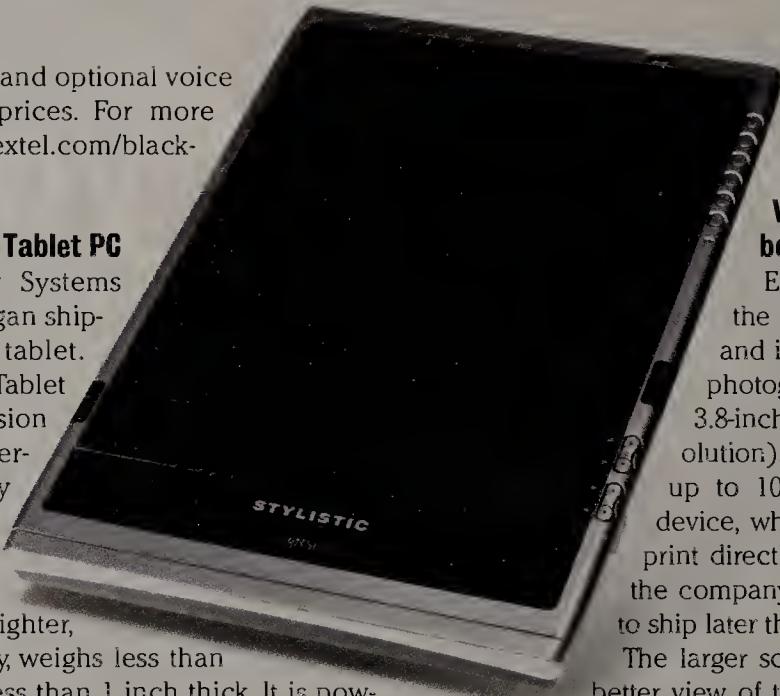
The tablet also has a Gigabit Ethernet LAN port (10/100/1000 Base-T/TX) for fast network connectivity and comes with an option for wireless 802.11a, b and g connections. The device features a dedicated Smart Card reader for security, and a built-in Memory Stick/Secure Digital media slot for media-card storage. Other features include 256M bytes of SDRAM (up to 2G bytes possible), a 40G- or 60G-byte hard drive, a Type I or Type II PC Card slot, two USB 2.0 ports, an IEEE 1394 port and integrated dial-up modem. The tablet runs Windows XP Tablet PC Edition and includes the Office OneNote 2003 application. The ST5000 is priced starting at about \$2,050 through Fujitsu's direct sales force, Web site and channel partners.

### RIM adds speakerphone to BlackBerry

Research in Motion and Nextel last week launched the latest BlackBerry handheld. The BlackBerry 7510 includes a high-resolution color screen, access to one or multiple corporate and personal e-mail addresses, built-in cell phone, built-in speakerphone, personal organizer and Web browser. It also includes Nextel's Nationwide Direct Connect walkie-talkie feature, and supports applications built with Java 2 Micro Edition. Other supported features include cradle-free wireless e-mail synchronization and integrated e-mail attachment viewing (Word, Excel, PowerPoint, PDF, WordPerfect and ASCII file formats).

The device supports 16M bytes of flash memory and 2M bytes of SRAM; includes a rechargeable and removable lithium battery; has an optional extended battery; and connects to a PC via USB port. Nextel is selling the device for about \$350, with data service plans starting at

The BlackBerry 7510 comes with Nextel's walkie-talkie feature.



Fujitsu's latest Tablet PC has a brighter, 12.1-inch XGA display.

### View digital photos on a better screen

Epson last week announced the P-1000 portable hard drive and image viewer that lets digital photographers view photos on a 3.8-inch color LCD screen (VGA resolution). In addition, users can store up to 10G bytes of photos on the device, which then can connect and print directly to several Epson printers, the company says. The P-1000, expected to ship later this month, is priced at \$599.

The larger screen gives photographers a better view of their photos. In addition, the device offers three colors per pixel, and a higher density of 212 pixels per inch compared with one color per pixel and 100 pixels per inch on an average digital camera display, the company says. Other features include the ability to zoom in and rotate images; play a slide show; and connect to a television, monitor or projector with National Television Standard Code or phase-alternating line inputs.

The P-1000 supports several memory cards — native support for Compact Flash (Type I and II) and IBM Microdrive, and support for Memory Stick, Smart Media, Secure Digital and MultiMedia Cards through an optional third-party adapter. The device also can print directly to an Epson printer (including the Stylus Photo 820, 900, 1280 and 2200 models), the company says. When connected to a PC or Macintosh, it acts as an external portable hard drive (via USB port).

Shaw can be reached at [kshaw@nww.com](mailto:kshaw@nww.com).

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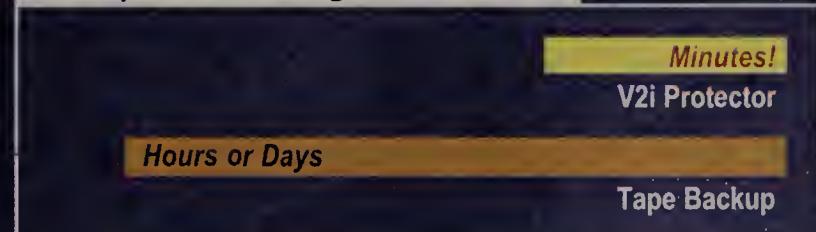
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## EDITORIAL

John Dix

## Start-up looks to leverage corporate IM

**A**nticipating that instant messaging will play an increasingly important role in collaboration, start-up Convoq is gearing up to introduce an application next month that adds video- and Web conferencing to IM.

Led by Charles Digate, one-time CEO of e-mail company Beyond Inc., Convoq ASAP is what the company calls an instant meeting system. You can find people to meet with, meet right away or "as soon as present" (hence the ASAP moniker), and choose your method of communications: chat, audio- or videoconferencing, or application sharing.

Participants are identified from your IM list or invited via e-mail, a key strength being that contacts don't need to be running the ASAP client. They can participate from Windows, Macintosh or Linux systems without downloading anything. They don't even need to be running the same flavor of IM.

How? Convoq ASAP is a hosted application — all connections go through Convoq's data center — and Flash is used to build the user interface in real time on machines that don't have the client.

Flash has built-in audio and video coder/decoder so any PC that has speakers and a microphone can participate in full audio and, if they don't have a camera, at least one-way videoconferences.

Digate says the initial sales focus is on support, professional services and sales operations — the types of users that need to be able to quickly assemble people to answer questions or resolve problems.

To facilitate the meeting process ASAP supports something called Lifelines. A supplier, for example, could make Lifelines available to customers, which when clicked, establish connections to available support personnel or their designated stand-ins. If no one is available at the moment, the "as soon as present" option could be invoked.

Digate says the product is in the final phase of development and will be officially launched next month, but IM users can demo it by downloading a free version of the client from [www.convoq.com](http://www.convoq.com).

Although he won't reveal pricing, Digate says ASAP will be subscription-based. There will be one price for users who meet with up to two people (no time limit), and a higher fee for up to six people per meeting.

While Convoq eventually will face stiff competition as Microsoft and other vendors integrate their messaging and meeting tools, Convoq's advantages are that it will work with all types of IM and the company apparently will beat the others to market with this interesting new approach.

— John Dix  
Editor in chief  
[jdix@nww.com](mailto:jdix@nww.com)

### Need broader tips

I found the tips offered in the story "Adding 'oomph' to your network" ([www.nwfusion.com](http://www.nwfusion.com), DocFinder: 9223) to be of very limited applicability.

Going jumbo is only a good idea for server-to-server file transfers or back-up jobs. Used generally, it can cause Maximum Transmission Unit size problems that are very difficult to diagnose.

The suggestion to check your wiring is good general advice, but how about a real tip on where to check, and how? Turning on full duplex everywhere isn't good advice, but detecting half-full duplex mismatches is. The problem is the Multi Router Traffic Grapher and most other tools won't help you do this.

Extending Layer 3 switching to the wiring closet will make things more complex, and for most situations, will do little to improve performance.

The advice to add route control needs to be prefaced by the conditions where this will have impact. For internal applications on a private network, route control will have little or no impact.

The suggestion to employ packet shaping — or prioritization — is a good recommendation. Packeteer is merely one example of a vendor that offers this technology. A more widely applicable tip would be much better. Compression is also a good recommendation, but again, Peribit is merely one example.

The advice about speeding up Secure Sockets Layer transactions is another single-source tool recommendation, rather than a more widely applicable tip. The principles involved appear valid and useful, but uniquely implemented in Redline's product.

Ron Watt  
Senior solutions consultant  
Empowered Networks  
Ottawa

E-mail letters to [jdix@nww.com](mailto:jdix@nww.com) or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.



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Mike Keefe 2004

# opinions!

### Protecting U.S. jobs

Regarding your editorial on offshore outsourcing ("Catching up with the Quovix community," DocFinder: 9224): In response to a story on outsourcing to India that ran in June in CIO magazine, a reader who is a consultant from Chennai, India, touts giving work to "an Indian with an Ivy League education working in India at \$10,000 per year" as more advantageous than employing "an American night schooler who demands \$70,000 per year."

This got me thinking. I propose outsourcing all executive positions (from the board of directors down) to India. I figure companies could pay each, say, \$30,000 per year. If a dozen execs at a company making an average \$10 million per year (\$120 million total) are replaced by 12 Indians (\$360,000), this would produce a savings of \$119,640,000! I say include upper management in outsourcing.

David Easter  
Fallston, Md.

Regarding offshore outsourcing: I have taken over several projects where the client found it very difficult to deal with an offshore vendor. One system had at least five programmers working on it, each with his own method and protocol personality.

Since then my company has reviewed several other situations in which clients had the same negative issues. Problems with vendor maintenance, communications and the programmer just not knowing or understanding the client significantly outweighed the dollar savings. Two or three years down the road, offshore outsourcing will be viewed more realistically by U.S. industry, and a major shift back to domestic programmers will resume, especially for small to midsize application development.

Nick Santino  
Founder and president  
Argento Systems  
New York

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**SECURITY ISSUES**

W. David Stephenson

**M**any corporations have been less than enthusiastic about new homeland security responsibilities, which they see as threatening to disrupt just-in-time manufacturing strategies, impose new costs and introduce yet another set of regulations. There were similar complaints when environmental regulations were imposed in the 1970s and 1980s. Yet, by the early 1990s, companies such as DuPont and 3M had gained a competitive advantage by adopting waste-reduction strategies that were good for the environment and the bottom line.

I believe a similar paradigm shift, from viewing homeland security as a costly burden to seeing it as a competitive advantage, is possible. There are three benefits to companies taking the lead on homeland security strategies that don't just meet the letter of the law, but do so in a synergistic way:

- **Increased collaboration.** Sept. 11 dramatically reminded us of the consequences for security of not "connecting the dots." However, companies already were paying a high price for lack of coordination, especially in logistics and supply-chain management, which made it nearly impossible for everyone in the supply chain to know on a real-time basis where a container was and what it held. Now 65 companies in the shipping and logistics field have formed the Smart and Secure Trade Lanes Initiative (SST) to create an end-to-end, supply-chain security system. The collaboration will integrate data flow that will help homeland security agencies collaborate to reduce container risks. Equally important from the commercial standpoint, it will allow sharing of data to overcome the lack of integration in the shipping and logistics industry.

- **Error reduction.** Dual-use technologies can reduce both the chance that a terrorist will slip into the country and that vital cargo will get lost

# Corporate homeland security a win-win

on a railroad siding somewhere. The SST system exceeds the new U.S. Customs requirement that manifests for cargo from foreign ports be reported a full day before departure. It also lets participating companies get chain-of-custody audit trails of the containers' history that can be used to improve supply chains' structure and efficiency.

- **Employee empowerment.** Both homeland security and smart companies need empowered individuals who can get the information they need to act intelligently. Subsets of XML are critical to global business and emergency response, letting those who need information from diverse sources access them on a real-time basis, seamlessly. EmXML, the emergency notification standard that is under development, will let first responders, security officials, public health agency officials and others immediately share critical information during an emergency. EbXML, the business standard, will streamline business operations, setting global standards for exchanging business messages, establishing trading relationships, communicating data in common terms, and defining and registering business processes. The more extensive the adoption of both schemas, the more valuable each will be.

Both economic globalization and the war on terror require that we adopt new technologies and attitudes. Creative companies will get beyond their frustrations with new regulations and responsibilities to gain a competitive advantage through strategies that cut risk and pay economic dividends.

*Stephenson is a strategic communication consultant specializing in homeland security. He can be reached at D.Stephenson@Stephensonstrategies.com.*

**Both economic globalization and the war on terror require that we adopt new technologies and attitudes.**

**TELECOM CATALYST**

Daniel Briere



In scanning the coverage of the telecom recovery, we read about the excesses of the past and how we "know better" now. Everyone is singing the same tune: "Things are so different now..." "We'll never return to the 'old days.'" ... "It'll never be the same." And the sad part is, most people believe it.

The facts are we all want to go back to the good old days. We are all acting like we did in the good old days. The reactions are like the good old days — just on a smaller, less obvious scale.

Overinvestment is still ripe — do you really believe all these wireless strategies are going to pan out? The market is still crazy — how else do you explain a near 100% run-up on a DSL stock based on a vapid announcement that the vendor tested its gear in Cisco's lab, or 60,000 postings about a stock on Yahoo's stock message boards in one day?

Everybody is jumping back in the water, clothes off, with glee.

If you don't buy into the craze, you get slammed for not taking part: investment bankers for not chasing the deals; stock brokers for not investing in stocks that jumped 30% in a week; venture capitalists for not going in on the deals everyone else is chasing; consultants for not buying into the "clear trends." If you take part, most people freely admit the telecom recovery is not fully factually based; it's emotionally based. Says one investment banker friend of mine, "It's all bogus, but what are you going to do? Investors want results." So the first thing that is wrong is that the "system" has lost any semblance of checks and balances.

A second problem is the lack of attention to fundamentals, which once more are being ignored by many in the industry. Overcapacity is still an issue. The major "stable" players in the market have sizable revenue at risk because of VoIP expansion, cable displacement services, cellular conversions and so on. This is not going to magically correct itself.

A third problem is the danger lurking in reactionary strategies — when things go bad, the reaction can be knee-jerk and severe, as we've

# Has anything really changed?

seen in the past few years when the industry was abruptly halted because of lack of spending. The fragility of so many players, and the impending effect of bankruptcy-driven pricing, is still hanging out there untested, and a quick reaction by a series of bad profit announcements could send us back down again.

Cisco CEO John Chambers has been saying for a while that trust and confidence need to be re-instilled in the system, and the last quarter has seen a regaining of these psychological foundations in telecom. But there's a difference between a slow, steady and therefore somewhat stable regrowth, and the rampant, out-of-control, rush-for-the-gold herd mentality that governed the telecom industry a few years ago.

There's a danger that the same forces that took our telecom industry ball and ran with it — into the ground — are rearing their heads again.

The insanity of the stock market and its get-rich-quick rewards is again starting to seep into the psyche of the way decisions are made, and that's the way a lot of money was made and lost in the last binge. The people driving that get their money off the front end — venture capitalists whose investment can cash out early on, and investment bankers who make money on the deals. Just because there is easy money does not mean real value is being created.

You'd like to think that the adage, "Those who do not study history are bound to repeat it" would be true, but the problem is everyone knows what happened, and yet it's still returning. There are still fundamental issues to deal with. The market pressures on the telcos are going to increase, not decrease, as new disrupting technologies such as VoIP affect the top line of revenue.

So get out your favorite drink and toast to the wild ride, because it's beginning again. Let's just not be surprised if it has many of the same endings.

*Briere is CEO of TeleChoice, a market strategy consultancy for the telecommunications industry. He can be reached at telecomcatalyst@telechoice.com.*

**There's a danger that the same forces that took our telecom industry ball and ran with it — into the ground — are rearing their heads again.**

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# Face-off

Two industry experts debate whether perimeter security alone can deter rogue wireless access points.



## Yes, by Marvin Chartoff

Rogue access points are among the greatest security threats in corporate America. Network technology has become so inexpensive and easy to set up that many office workers have configured wireless LANs themselves. They typically set up an access point in a conference room or other common area and plug into an enterprise network. Most are not thinking about security, which usually is turned off by default. Many IT departments are not monitoring the network perimeter for rogue access points if they haven't been thinking about a wireless strategy.

How do you deter rogue access points? While the starting point should be a strong policy against them, including penalties for noncompliance, most companies don't follow through on compliance. Having a corporate strategy and architecture established for the use of wireless technology also can help. Some business departments might be willing to fund an early deployment of your vision if you demonstrate the benefits they will achieve.

However, the best solution involves network perimeter security. There is no silver bullet, but there are a few techniques that can reduce the risk that rogue access points go undiscovered. Combined with a sufficient level of security on destination servers and applications, these techniques can close security holes opened by rogue access points.

A combination of wireless and wireline intrusion-detection tools can capture telltale signs of a rogue access point. If you have standardized on your desktop and laptop network interface card (NIC) vendors, the media access control (MAC) address of the access point typically will have a different vendor code than that of your official devices. The source MAC address of a packet from an end user also will be different than the address of the access point connected to the network. If you do an SNMP discovery or similar interrogation process, you might uncover an unidentified device that would merit further investigation. If your facility is small enough, you could use a radio frequency monitoring device from a vendor such as AirMagnet, and walk around with it to see if you pick up a signal from an access point. You also could use a laptop with a WLAN NIC and a standard WLAN client management utility. More sophisticated WLAN troubleshooting tools, such as AirDefense's RogueWatch, can provide ongoing monitoring and collect additional information for pinpointing a rogue access point's location.

Uncovering a rogue access point should be sufficient deterrence to employees who thought they could hide behind the anonymity of the network port in the wall. If you have a corporate-sanctioned wireless network, no doubt they would gladly use it.

IT departments had gained control of their environment since the last rogue device, the PC, was introduced over 20 years ago. Rogue WLANs are threatening to destabilize the environment again. With a sound plan for utilizing wireless technology and improvements in network management processes and tools for perimeter security, risks can be greatly reduced and employees will be back under IT's control.

*Chartoff is CTO of Global Infrastructure Services at Unisys. He can be reached at marvin.chartoff@unisys.com.*

## Can rogue wireless LANs be eliminated?



## No, by Brian Boyland

The ubiquitous and transient nature of wireless technology presents a constantly moving target. Wireless access points let authorized and unauthorized users gain the same level of access through the same access point. Standard network operations center tools are reactive in detecting unauthorized devices. Ping-sweeps and auto-discoveries can identify devices after they have accessed the network by comparing their results against the network map stored in a network management system database. Analyzing a new device's management information base data to determine that it is a rogue access point is subject to misinterpretation. In addition, such network scans require time and bandwidth to complete, presenting excessive NMS traffic load and leaving a window of access open between scans. Increasing the interval of scanning only magnifies the problem. Random or spot scans of the network are ineffective, as they rely on the "luck of the draw."

Multiple-level security is the best defense against unauthorized access. Wireless LAN (WLAN) technology complicates the issue because of open access to the airwaves and inability to control the radiation of radio frequency signal. Therefore, in a wireless scenario, only authenticated users should be allowed to use network-attached resources.

It is possible to perform radio frequency scanning on the premises. But success is subject to timing — you need to catch the device in operation, which requires continuous frequency monitoring that can be labor- and capital-intensive. Furthermore, radio frequency scanners are limited in range and accuracy. Stray radio frequency from a variety of legitimate sources, such as other WLANs and cordless phones, can generate false signals to a common scanner. It also is important to note that radio frequency scanning can only detect the presence of a device, but does not correlate it with access to your network. Multi-tenant buildings and densely packed zones can present a challenge. There are products available that discriminate true 802.11 from other radio frequency, but they are still subject to timing, neighboring WLANs and inaccuracies in NMS databases.

Regardless of the technique for identifying the presence of an unauthorized wireless access point, the weak point is timing. The results of the scan must be compared against a reference base of legitimate access points to identify the intruder. Reliance on the accuracy and currency of the database implies tight control on the management process. User authentication for all network access is still essential to providing a truly secured network.

The only effective means of securing corporate assets remains multiple levels of security, including securing the destination. An employee with a wireless router still can expose a company to attack without endpoint security. Although it is a good idea to continue to develop and deploy perimeter security, neither the technologies nor the techniques are mature. Proper domain control and security of the endpoint are still essential. It is a mistake to rely on any one scheme.



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Face-off authors Marvin Chartoff and Brian Boyland

will add their thoughts to the discussion.

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Boyland is the Americas Network Engineering practice leader at Cap Gemini Ernst & Young. He can be reached at brian.boyland@cgey.com.



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# NetworkWorld Review

## SSL VPN GATEWAYS

# NetScreen, Nokia top the growing field of products that target simplified secure remote access

■ BY JOEL SNYDER, NETWORK WORLD GLOBAL TEST ALLIANCE

# S

ecurity with ease of use is the promise of Secure Sockets Layer VPNs. In our test of seven SSL VPN gateways — from AEP, F5 Networks, NetScreen Technologies, Netilla, Nokia, Symantec and Whale Communications — we assessed how well each is equipped to provide secure remote access to corporate applications.

The good news is that several products are well-suited for enterprise use. Our World Class award goes to NetScreen for its outstanding application support, good access control mechanisms and overall interoperability. Nokia, Symantec and F5 all make our short list because of the broad spectrum of application support they offer.

Our basic assumption for testing SSL VPNs is that they must fit into existing networks and application environments (see How we did it, www.nwfusion.com, DocFinder: 9225).

To that end, we tested interoperability of each device against 20 enterprise applications.

We tested these products from the point of view of network and security professionals; focusing heavily on access control and security features.

In terms of features, we evaluated auditing, accounting, reporting and logging tools. We also tested client integrity scanners, which help ensure that virus scanners and firewall features are up to date.

### Applications are everything

The biggest difference between SSL VPNs and traditional IP Security remote access VPNs is that the IPSec standard requires installation of client code on the end user's system, while SSL VPNs focus on making applications available through any Web browser.

In some cases, SSL VPNs must provide secure access to the applications that are served up as static Web pages on HTTP servers, but taking Web traffic in one port and sending it out another is not where these products bring their greatest value. SSL VPNs are deployed for bigger, more compelling reasons such as complex application translation of Web-to-e-mail servers, corporate directory and calendar systems, e-commerce applications, file sharing, and remote system management.

When it comes to proxying and application translation (see "SSL terms and conditions," page 44), we found big differences between products (see graphic, right). AEP and Whale were the weakest in this area, supporting the smallest

number of application translators and proxies. Nokia was the only one of the stronger products to support application translation for FTP, Network File System (NFS) and Microsoft file servers. With F5, NetScreen and Symantec each offering a subset of the three, Netilla was the only offering to include translation for both Windows Terminal Services and a extensive array of terminal emulators, including telnet, Secure Shell (SSH) and

mechanisms for getting direct access into the network: port forwarding and network extension. Port forwarding lets you protect well-behaved applications on known servers, and network extension gives broader access via tunneling to an entire network.

The further down this direct access path you go, though, the more complicated and risky your SSL VPN deployment will be. To accomplish port for-

warding or network extension, the SSL VPN gateway must push out software to the end user's workstation. This raises browser compatibility issues, operating system problems and security concerns. For example, a user sitting in front of Microsoft's Internet Explorer with browser security set to

"high" would not be able to use any of these features. Unfortunately, permissions to lower browser security are not always available.

A second problem with port forwarding and network extension is security. One promoted strength of SSL VPNs is the ability to look into the application layer and give detailed access control to the network manager. When port forwarding and network extension come into play, SSL VPNs no longer offer such access control to applications because

they are no longer aware of the underlying application. Rules down to the URL level, one of the characteristics of SSL VPN technology, aren't available when using network extension and port forwarding.

All the SSL gateways we looked at except for AEP and Netilla provide some port-forwarding functionality (see graphic, page 44). However, port forwarding is not sufficient for all applications. A good example is FTP, which uses IP addresses and port numbers within the protocol to identify a server and client socket for data transfer. Port forwarding won't work with all FTP clients, unless the SSL VPN gateway knows that it is forwarding FTP traffic and rewrites IP addresses within the traffic.

Application layer gateways (ALG) could add this kind of knowledge to port forwarding, and they are common in real firewalls. SSL VPN gateway vendors made an effort to add ALGs to their port forwarding to two areas: in e-mail, specifically MAPI (for Exchange clients) and Notes smarts, which ships with the NetScreen, Nokia and Symantec gateways; and in remote desktop clients using Citrix terminal services, which ships with NetScreen and Nokia gateways.

Instead of making port forwarding smarter with ALGs, many SSL VPN gateway products support network extension: connection of the end user's remote system to the network behind



**The NetScreen-SA 5000 edged out competition from Nokia's Secure Access System to earn our World Class award because of its outstanding application support, good access control mechanisms and overall interoperability.**

IBM 3270. We tested all but the IBM emulations and had good results. F5 and NetScreen also included terminal emulator support for telnet and SSH, but they struck out because their emulators didn't work more than 25% of the time.

Because the products we tested offer such a variety of options, for you to pick the right gateway for your network you'll need a firm understanding of which applications you need translation for and be able to rank them in terms of importance. For example, Symantec and F5 gateways include e-mail application translation — so users can read and send mail via an application running on the gateway. Unfortunately, Symantec's built-in Web mail feature doesn't work if you have a lot of mail in your mailbox.

Even SSL VPN gateways that don't support a built-in Web mail tool would let you connect to a corporate messaging application, such as Microsoft Outlook Web Access, IBM's iNotes or the open source SquirrelMail. As our interoperability testing indicates, these rich applications have their own problems. So you might be left with the difficult choice of a rich Web-based messaging application that not everyone can use, or a less powerful and feature-poor Web mail system that is friendlier to unusual or older browsers.

Some applications cannot be translated, and SSL VPN gateways have two

### Lining up proxy and application translation support

**Support for Web applications, application translation of file servers and application translation of mail, terminal services and remote hosting access (Telnet and SSH) varies across applications. This chart only indicates claimed support, not the results of our interoperability testing.**

	Web		File services			Web mail	Other common applications		
	HTTP	HTTPS	FTP	CIFS	NFS		terminal services	telnet	SSH
<b>AEP</b>	✓							✓	
<b>F5</b>	✓	✓	✓	✓	✓	✓		✓	✓
<b>NetScreen</b>	✓	✓		✓	✓			✓	✓
<b>Netilla</b>	✓	✓		✓			✓	✓+	✓+
<b>Nokia</b>	✓	✓	✓	✓	✓				
<b>Symantec</b>	✓	✓	✓	✓	✓		✓		
<b>Whale</b>	✓	✓		✓					

✓ Supports   ✓+ Supports basic and additional applications

the SSL VPN gateway. In the group we looked at, all but Nokia and Whale include network extension technology.

E-mail is arguably the most popular SSL gateway feature because our testing found yet another way that some products support e-mail. AEP, NetScreen, Nokia and Symantec all include proxies for the standard mail protocols Simple Mail Transfer Protocol (SMTP), Post Office Protocol and Internet Message Access Protocol. The idea is that you'll point your POP or IMAP client mail application at the SSL VPN gateway, encrypting from client to the gateway using standard POP-over-SSL, IMAP-over-SSL and SMTP-over-SSL, thus adding security to the mail transactions. This technique also can add SSL to older mail servers or give access to servers that are on private address space. The benefit of using this technique is compatibility across all modern platforms and modern e-mail clients without requiring special operating system access the way port forwarding and network extension do.

### Interoperability problems

Web applications are frightening things to security vendors. The extreme generosity of browsers in accepting and displaying incomplete Web pages, incorrect JavaScript and illegible Java has led to a generation of applications that make little sense from a software development point of view — but seem to work. Building an SSLVPN gateway to handle these applications is an unenviable task. We tested 20 applications with seven browser/platform combinations and found wide variation in what works (see

graphic, page 45, top).

One goal for this review was to test the vendors' claims that these products are easier to set up and use than IPSec VPNs. Along the way, we saw a lot of backpedaling: These products are easier for the end user to use, but sometimes harder for the network manager to maintain. In some cases, we know that updating client software, clicking hidden or obscure feature boxes, and a hefty dose of quality technical support could have solved the problems we saw. But we wanted to see how well the average network or security manager — not a Web application programmer — would do. We ruled out changes to client systems as unacceptable and not in the spirit of SSLVPNs' goal of security with ease of use.

We started with five basic Web applications, some of which included basic JavaScript. The only vendor to support five applications on seven platforms was Nokia, although F5 and NetScreen only missed one each, while Whale and Symantec missed three or less. AEP got bad marks on two of the applications, one with JavaScript and the other going to an SSL-protected Web server in the back — AEP doesn't support back-end servers with SSL, although everyone else does. Netilla also lost points for losing graphics. Although every page eventually loaded

### Tracking port forwarding and network extension

**We found problems in the port forwarding and network extension implementations in most of the products we tested. NetScreen worked the best in our tests, but spotty platform compatibility across all products makes this less than a guaranteed universal solution.**

	Port forwarding		Network extension	
	Win3 2	Macintosh	Win3 2	Macintosh
AEP			✓	
F5	✓		✓	
NetScreen	✓	✓	✓	
Netilla			✓	
Nokia	✓	✓		
Symantec	✓		✓	
Whale	✓			

✓ Supports

✗ Supposed to work, but didn't in all our tests all the time.

correctly if we pressed "Reload" enough, we gave Netilla only half-credit on applications that missed a lot of graphics the first time through.

Next up in our testing were the two big mail applications, Outlook Web Access 2003 and iNotes, versions 6.0 and 6.5. Here, Nokia came closest to getting it right, with AEP and Symantec next in line (although Symantec did manage to crash our Netscape browser when feeding it iNotes). The newness of Outlook 2003 threw a bit of a curve at our SSL gateways. However, we argue that a big question for

SSLVPNs is whether these products act like appliances, independent of the software behind them, or will they put you on a treadmill keeping things up to date?

It's pretty clear that vendors don't expect these gateways to work without some tuning. We restricted ourselves to out-of-the-box configuration, but most of the systems had a number of obscure knobs and adjustments that were added to help increase compatibility. Netilla is a good example. When defining an application, for example, you can select either "Fast HTML Translation" or "Full HTML Translation." The only documentation for how to

choose one or the other is the ambiguous note: "Fast is appropriate for most pages." As another example, Whale devotes 75 pages of documentation to fine-tuning the handling of applications.

Our third series of tests used three Web-based applications that included Java and different types of Flash. The results were dismal. F5, NetScreen and Symantec managed to each get one of the applications working some of the time. AEP, Netilla, Nokia and Whale scored zero in this phase. The lesson is simple: Advanced applications with tools such as Java and Flash just aren't going to work easily through SSLVPN gateways, not without using techniques such as port forwarding or network extension.

Our fourth set of tests looked at how these devices handled Microsoft, FTP and NFS file servers through application translation. Scoring this was tougher because not every device claimed to support all protocols. But we found products too smart for their own good. F5's snazzy tool for browsing file servers wouldn't work properly on our Safari browser; Netilla's tool wouldn't work properly on anything but Internet Explorer browser on Windows; and Whale couldn't handle older versions of Internet Explorer or Netscape.

We also managed to catch up both Nokia and Symantec with FTP server compatibility problems. When tested against a standard Unix FTP server, both worked perfectly. But when we aimed them at our OpenVMS server, neither could hack it.

Our last series of tests looked at the port forwarding and network-extension capabilities. We maintained a strict rule about technical support: None was allowed.

Macintosh users be warned: Even the products that claim to work with Macintosh systems (NetScreen and Nokia say they support Mac OS X for port forwarding) don't fully hit the mark. We got NetScreen to work with one of our three Macintosh browsers, Safari, but we never could get Nokia to start properly.

For Windows users, port forwarding —

## SSL terms and conditions

The Secure Sockets Layer VPN market brings together many technologies to accomplish the goal of secure remote access. Understanding the strengths and limitations of SSLVPNs means knowing the meaning of four critical terms: proxying, application translation, port forwarding and network extension.

SSLVPN devices all start with at least one function: proxying Web pages. For the SSLVPN system that means connecting to a Web server, downloading a Web page and shipping it back over an SSL connection to the end user's browser. The devil is in the details, but it's pretty easy to understand.

Things get complicated when you start talking about anything other than a Web page. The next step up in complexity involves application translation. A good example of this is how SSLVPN devices treat file servers. The SSLVPN device will talk the native file server protocol, such as Microsoft's CIFS or FTP. But the application protocol is translated by the SSLVPN device from FTP or CIFS on the inside, to HTTP and HTML on the outside so that the end user sees the file server as if it were a Web page, in effect "Webifying" the application.

Application translation works for some things, but not for others. Some applications, such as Microsoft Outlook or instant-messaging tools, have a particular look and feel that is lost during the translation to a Web-based interface. This brings us to port forwarding, a technique that works for well-defined applications. Port forwarding requires a very small application that runs on the end user's system, often a Java or ActiveX tool. The

port forwarder listens for connections on a port that are defined for each application. When packets come in on that port, they are tunneled inside of an SSL connection to the SSLVPN device, which unpacks them and forwards them to the real application server. To use the port forwarder, the end user simply points the application he wants to run at his own system rather than the real application server.

Port forwarding is a very effective technique, but it also has some severe limitations. For port forwarding to work, the applications need to be well-behaved and predictable in their network connectivity patterns and needs. Although there are port-forwarding tools written in Java that work across platforms, our experience was that port forwarders tend to be platform-specific.

The fourth technology some vendors are including in their products is network extension. SSLVPN network extension connects the end user's system to the corporate network, with access controls only based on network-layer information, such as destination IP address and port number.

Network extension also moves completely away from operating system independence and requires administrative access to the local system. SSLVPN network extension runs on top of the SSL protocol, trading off the higher security of IP Security for simplicity of management and greater robustness in the face of different network topologies, such as firewalls and network address translation.

— Joel Snyder

where supported — works pretty well. We had no problems getting F5, NetScreen, Nokia and Symantec to forward single-port and multi-port applications. Whale hiccuped, refusing to run in the Netscape browser and claiming that a user needs to be a "Power User" to start the port forwarder. That would be reasonable, except that we were logged in as Administrator.

We hit glitches on the network extension front, too. While NetScreen and Netilla ran flawlessly, AEP wouldn't support the User Datagram Protocol (UDP)-based application we tried. F5 worked sometimes but other times we got a blue-screen on Windows 2000. Symantec's VPN also had problems, largely because there's no documentation and no client.

Based on our interoperability testing, we conclude that these products fall short of the promise of an easy-to-use universal gateway to enterprise applications. Simple Web pages and basic JavaScript seem to work pretty well in the better products, but we were disappointed that Java, Flash, file services, port forwarding and network-extension support were haphazard, difficult

to work with and not interoperable.

### Access control counts

As security appliances, these products need to provide fine-grained control of security of applications.

All products included the ability to enable and disable access to applications using groups. At the simplest end of the spectrum are AEP, F5 and Netilla. Netilla lets the network manager define a Web application as a series of URLs. Once the application is defined, users and groups are given or denied access to it. AEP has a similar level of control. F5 comes at the access control from the group level, but because of the way the interface is designed, you are actively discouraged from having more than a small number of groups, and users can be in only one group. In some environments, just saying "yes" or "no" at the application level is fine, but you can run out of options quickly.

With Symantec, rather than apply access controls to applications, you can apply access controls to groups and users. Thus, you say what a group has access to and eas-

### Hitting on interoperability

This chart shows how each product fared against our application interoperability tests across all seven platform/browser combinations. 100% means all applications worked on all platforms. These percentages take into account lack of support as stated by vendors and interoperability failure in our tests. To get the most information out of this chart, find the application category you care about most and compare products in that column.

	Basic Web	Mail	Advanced Web	File services	Port forwarding and network extension
AEP	60%	75%	0%	0%	13%
F5	97%	64%	11%	72%	38%
NetScreen	100%	39%	11%	78%	63%
Netilla	73%	29%	0%	11%	25%
Nokia	100%	86%	0%	61%	63%
Symantec	94%	71%	11%	28%	38%
Whale	93%	36%	0%	22%	13%

ily manage many different groups and their access controls. In Symantec's hierarchical model, it's easy to say that engineers can read and write files from the file server, but QA testers only can read those same files. That sounds easy, but only Symantec and NetScreen let you think that way. Symantec's

model is powerful. There are a lot of complexities to what you can do, but the product doesn't make it hard to get started as it has a good GUI front end.

Another dimension to access control is going further than just group or user. In this regard, Nokia is the undisputed champ,

## Net Results

RATING 4.5	WORLD CLASS WINNER NetScreen-SA 5000 v3.3	RATING 4.4	Nokia Secure Access System v1.1	RATING 3.9	FirePass Controller 4000 v4.0.2	RATING 3.8	Symantec Clientless VPN Gateway v4.0.2	RATING 3.3	Netilla Security Platform v4.0.1	RATING 3.3	e-Gap Remote Access Appliance v2.5	RATING 3.0	AEP SureWare A-Gate AG-600 v2
<b>Company:</b> NetScreen Technologies, <a href="http://www.netscreen.com">www.netscreen.com</a> <b>Price:</b> \$50,000. <b>Pros:</b> Strong authentication and access control features; many "thin client" options to support cross-platform users; innovative mail pass-through authentication; good control over SSL security settings; network extension more controllable than most. <b>Cons:</b> Reporting moderately weak; cache cleaner unacceptably slow; no FTP support.	<b>Company:</b> Nokia, <a href="http://www.nokia.com">www.nokia.com</a> <b>Price:</b> \$55,000 as tested. <b>Pros:</b> Outstanding fine-grained access control; very good authentication support including certificates and group-mapping features; very smart break-in/evasion features. <b>Cons:</b> Having two management interfaces can be confusing; logging via IPSO system is painful; lacking content-sensitive help; sparse GUI; portal support poor.	<b>Company:</b> F5 Networks, <a href="http://www.f5.com">www.f5.com</a> <b>Price:</b> \$24,990 as tested. <b>Pros:</b> Broad range of applications and authentication methods supported; delegated management; outstanding reporting/logging; virus scanning on uploads. <b>Cons:</b> Access control not finely grained; groups difficult to configure.	<b>Company:</b> Symantec, <a href="http://www.symantec.com">www.symantec.com</a> <b>Price:</b> Starts at \$9,500. <b>Pros:</b> Excellent access control model and configurability; real-time status and management very well done. <b>Cons:</b> More bugs throughout than most other products; good thinking in many areas clouded by brittle implementation; Layer 2 VPN is poor.	<b>Company:</b> Netilla Networks, <a href="http://www.netilla.com">www.netilla.com</a> <b>Price:</b> \$30,000 as tested. <b>Pros:</b> Outstanding support for terminal-based applications; additional network-layer firewall and DHCP features; session shadowing for support; add-ons to Windows Terminal Services, such as printer support; great documentation. <b>Cons:</b> No LDAP support; access control not finely grained; management GUI is slow.	<b>Company:</b> Whale Communications, <a href="http://www.whalecommunications.com">www.whalecommunications.com</a> <b>Price:</b> Starting at \$23,000. <b>Pros:</b> Application-layer firewall provides extensive control. <b>Cons:</b> Management system complex and lacks central control; highly Windows-centric reduces compatibility with other authentication schemes; documentation needs significant improvement.	<b>Company:</b> AEP Systems <b>Price:</b> \$9,000 as tested. <b>Pros:</b> Small form factor; built-in terminal services application translation. <b>Cons:</b> Very limited application support; poor configuration capabilities; start-up configuration insecure by default; weak auditing/logging; no internal portal.							

### The breakdown

	WORLD CLASS WINNER NetScreen	Nokia	F5	Symantec	Netilla	Whale	AEP
<b>Application support 30%</b>	4.5	4	4	3.5	4	3	3
<b>Access control 30%</b>	4.5	5	3	4	3	3.5	3
<b>Interoperability 25%</b>	4.5	4	4.5	4	3	3	3
<b>Authentication 10%</b>	4.5	5	4	3.5	3	4	3.5
<b>Logging and reporting 5%</b>	4	4	5	4	3	3	2
<b>TOTAL SCORE</b>	4.5	4.4	3.9	3.8	3.3	3.3	3.0

■ Scoring Key: 5: Exceptional; 4: Very good; 3: Average; 2: Below average; 1: Consistently subpar

although NetScreen and Whale also have some pieces of the big picture. For Nokia, the fine variations lie in what resources you have access to and what you can do with those resources. If you want to use a coarse control, you can pick groups that are permitted or denied access to a resource. But amazing control is just a click away. For example, you can permit access to a particular file if someone has authenticated using a Lightweight Directory Access Protocol (LDAP) server and his virus scanner is up to date.

## Handling authentication

**Most products cover the main bases, but there are subtle differences in the details. This chart only indicates claimed support, not the results of our interoperability testing. In our tests, LDAP is a particular problem because of the variation in databases, so check compatibility with your schema carefully.**

	RADIUS	LDAP	Digital certificates	Local user database	Windows
AEP	Yes (user only)	Yes	No	Yes	Yes
F5	Yes (user only)	Yes	No (add-on)	Yes	Yes
NetScreen	Yes (user & group)	Yes	No (add-on)	Yes	Yes
Netilla	Yes (user only)	No	No	Yes	Yes
Nokia	Yes (user & group)	Yes	Yes	Yes	Yes
Symantec	Yes (user only)	Yes	No	Yes	Yes
Whale	Yes (user only)	Yes	No (add-on)	No	Yes (may be local)

The (add-on) notation means that while you cannot use certificates for authentication, you can use them to supplement other authentication methods.

Whale throws a change-up when it comes to access control. While providing simple access controls, the strength of this product lies in its application-level firewall. Whale lets you dissect individual URLs and provide a high level of error checking and validation. For example, in a URL that submits data to a form, Whale can check each attribute that should be in the form for length, blocking malformed data. It sounds tedious, complicated and hard to use, and it is. Whale helps out the network manager by prepackaging some of the most popular applications with pre-built rules sets. Unfortunately, for the applications we tested (Outlook 2003 and iNotes), neither rule set was current or correct. The only way we got those applications to work was by disabling the firewalling the product offers. Whale offered to fix its rule sets, saying that it would do this for any customer and any application.

A major disappointment in access control is how SSL VPN gateways control access to file servers. Whale and Netilla had unacceptably poor control of access. With these products, once a user is let in to a share on the Windows network, the SSL VPN gateway offered no additional control over where he could go or what he could do. In contrast, NetScreen, Nokia, and Symantec let you define read and write access at the individual file level. F5 also impressed us by including a virus scanner, which lets you scan files for infections during upload.

## Authentication integration

Identifying users and putting them into

groups is a critical part of any SSL VPN deployment. We tried to consider large businesses and the infrastructure they would already have in testing these products. We focused on LDAP and RADIUS as the most likely candidates for authentication and turned up good and bad designs (see graphic, below).

RADIUS was an easy choice because of widespread availability of RADIUS servers and the common use of RADIUS to authenticate against Windows, Unix and token-based systems such as RSA Security's

client-side certificates for additional authentication, but not as a primary authentication method. For example, Whale has the concept of a "trusted endpoint," a user who not only authenticates but also presents a certificate. In defining access control in Whale's configuration, you can differentiate between users who have a certificate and those who don't. The idea is that a user will log on from home, at his home PC, and have his certificate; because he is trusted, he can be given a higher level of access than when he logs on from someone else's PC or an Internet kiosk, where his certificate won't be present. F5, NetScreen and Nokia all offer a similar configuration option.

## Reporting and logging

As security appliances, we expected these SSL gateways to have strong auditing, logging and reporting features. We wanted to see audits of every change to the configuration. We wanted session data, showing when users logged on, logged out and how much resource they had consumed. And we wanted transaction data, every single Web page going through the system, if not for accounting then at least for debugging and usage analysis.

F5 exceeded our expectations. In addition to all the logging we wanted, the F5 gateway also was smart enough to automatically push its logs up to a server somewhere else, using FTP, SMTP or a secure copy. NetScreen, Nokia and Symantec all gave acceptable levels of logging with some associated bells and whistles. Nokia had more than a dozen subsystems that you could individually change logging on, or you could pick particular users and applications and increase the level of logging either for debugging purposes or just to keep a closer eye on parts of the system. This was a nice enterprise-level feature, where it might not be practical to turn up high logging on a production system just to help catch one problem.

Getting the log files off of the SSL VPN gateway is always going to be a bit tricky. We were disappointed that no one included RADIUS accounting, even though everyone used RADIUS for authentication. Some systems, such as NetScreen and Symantec, naturally wanted to push logs up using SYSLOG. Without careful planning, this would overwhelm a normal SYSLOG server, mixing error messages with accounting information. Symantec has a good answer: It lets you pick different SYSLOG hosts for different services. Network managers might prefer to simply pull accounting data off the appliances themselves using a script, which is how Nokia and Whale serve it up.

We were also interested in real-time information. Although F5 had an excellent showing in this area, Symantec also won our admiration for its graphics and reporting, not only showing who was logged on, but also how the system itself was performing. A dashboard showing multiple graphs would have been a nice addition, but knowing what the CPU, memory and I/O load are will be great for any network man-



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ager who has to worry about performance. Netilla had a similar graphing capability for performance data. Whale caused us some concern because its real-time information tools didn't seem to work correctly. Even during the light load our testing presented, we could see that some events were being lost out of the real-time displays.

## Picking a product

It's difficult to pick an obvious favorite. While we were not overly excited by the AEP, Netilla or Whale offerings overall, each has its own strengths. Whale includes a sophisticated application layer firewall. Netilla has the most extensive set of application translation functions. However, these products looked more like they had been wedged into the SSL VPN gateway space and will be most appropriate when application requirements call for their specific strengths.

F5 holds our admiration for its easy-to-use interface and strong product. But it seems particularly weak in access control, something the product management team told us it is working on for future versions.

The NetScreen, Nokia and Symantec development teams all had done serious thinking about SSL VPNs from scratch, and their products are sprinkled with bits and pieces showing that they have spent a fair amount of time in the trenches getting this to work and understanding the tough issues.

*Snyder is a senior partner at Opus One in Tucson, Ariz. He can be reached at joel.snyder@opus1.com.*

## Thanks

**Thanks to all the vendors that loaned us software and hardware to complete this review. Those include Apple, for loan of a Powerbook for client tests; Avocent, for loan of an AMX KVM switch; Macromedia, Altio, IBM, Microsoft, Ipswitch and Citrix for assisting with installation and configuration of their applications; and VMware (soon to be EMC) for use of GSX Server to run multiple applications.**

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Management

# Strategies

CAREER DEVELOPMENT  
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## Let's get physical

IT security must include locked doors and premises protection, not just firewalls.

■ BY TIM GREENE

Wells Fargo bank offered \$100,000 in November to catch a thief who stole the Social Security numbers and account information of thousands of bank customers. While the crime sounds like something that a clever hacker might pull, in this case the crook did his work the old-fashioned way — he broke into a consultant's office and walked off with his computer.

This story, which had a happy ending for the bank and its customers, points to the need for IT security professionals to pay attention to the "guns and dogs" physical security that surrounds their networks. No amount of firewalls, encryption or access lists can stop a criminal who gets into a server room.

"IT guys really have to think about what's protecting their data. How much of that is Cisco or Microsoft or IBM, and how much of that is Pinkerton or Brinks?" says Phil Libin, president of CoreStreet, a vendor that makes equipment to control access to buildings and networks.

Once intruders with know-how are left alone with machines, the game is pretty much over. "I can have a hard drive out of a computer within 5 minutes," says Bill Farwell, head of the digital forensics practice at Deloitte Touche. Keeping data thieves away from your machines is key and requires learning more about securing hardware, rooms, buildings and campuses, he says.

Interest in this convergence of corporate security is growing. At a fall Computer Security Institute conference, a session on general security trends was booked in a room with seats for about 20. About 120 people showed up eager to discuss physical security, says session moderator Terri Curran, information security officer for the Center for Digital Forensic Studies and former chief security officer at Gillette. Government regulations on privacy in healthcare and accountability in financial institutions are spurring this interest. Protecting data is no longer a business-by-business decision; it can be the law.

One hurdle to leap is that people in charge of building security and those in charge of IT security come from different cultures. Many traditional security chiefs are retired cops who apply their knowl-

edge of personal safety to a business. IT security people worry more about who can break into a network electronically, Curran says.

Vulnerabilities can lie in the seams between these realms, says Andrew Stewart, the security practice lead for Intellinet, a network services consultancy. For instance, a financial institution he worked with had network terminals inside conference rooms located off a busy lobby guarded by a lone receptionist. The IT staff didn't consider that the room was unsecure and the physical security people didn't consider that a valuable asset was being exposed. "Many IT security people are locked into the mindset of thinking about virtual domains and not physical domains," he says.

More and more security professionals recognize this and are seeking dual certification, Curran says. One is the Certified Protection Professional granted by the American Society of Industrial Security for physical security expertise. The other is the Certified Information System Security Professional issued by the Information Systems Security Certification Consortium<sup>2</sup>.

Short of that, individuals can start to think differently, Farwell says. Physical security should be looked at as a series of concentric perimeters, with each layer more secure than the previous one. What belongs in which circle depends on the value the corporation places on it. A Web server that contains only corporate public information might have a lower value than one on which customers buy products. "If somebody steals a server, it costs \$10,000 or \$30,000 [for the machine], but it might represent \$5 million in lost revenue. You have to identify your assets. What are your crown jewels?" he says.

Once ranked, assets have to be protected

### Tips for extending network security

To keep your business data safe, consider the physical settings in which your networks live and the people who access them. Here are some suggested steps to take:

Cross-train physical security staff with IT security staff so they all think outside their respective boxes.

Consider giving a security officer authority over both physical and IT security.

Don't use unsecure protocols on your internal network because a physical security breach will leave it vulnerable.

Shore up or shut down network access points in public areas such as lobbies and lounges.

Train staff in security procedures so they don't leave keys and PINs lying around where someone can access them.

Never leave consultants and other "outsiders" alone in sensitive areas such as switch rooms and data centers.

Carefully screen the credentials of all IT staff.

accordingly. "You think access control," Farwell says. "At the first layer you have a key-card door. At the second door you need a key card plus a PIN."

When outside help needs to get in for upgrades and repairs, authorized staff must watch them at all times.

Screening those with cards and PINs is just as important, Curran says. "Hardened facilities, man-traps, biometrics are fine. You also have to check the backgrounds of people you let into the facility," she says. Someone with a criminal past obviously would be excluded. But a firewall expert with phony credentials can be just as dangerous, even if he fouls things up out of incompetence rather than bad intent, she says.

Implementing an overarching security

policy is essential and might require a chief security officer who has responsibility for both the safety of personnel and property as well as network security, Stewart says.

"When I ask who is in charge of network security, I often hear that it's part of everybody's job. But unless somebody is accountable for security, it won't get done," Stewart says. "Security is about accountability — whose fault is it when something occurs that should not occur?"

Even with someone clearly in charge, it's tough to know whether things are working well. No successful attacks could mean either none were tried or that some were tried and all were defeated. Companies don't know whether they have enough security until something goes wrong and they find out they didn't have enough, Stewart says.

In the case of Wells Fargo, the data was on the computer of a consultant and was outside bank facilities. In hindsight, it's easy to see that if the data was allowed on that computer, that computer should have been secured.

Luckily, the burglar apparently stole the computer for the hardware and software, not for the value of its contents. When the suspect used the computer's AOL account, investigators traced the connection to his house where they found the missing machine and made an arrest.

It's a happy ending to a story that need not have started at all if a tighter, converged security plan was in place. ■



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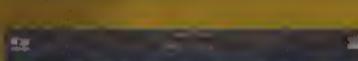
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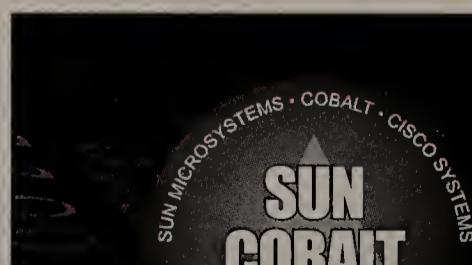
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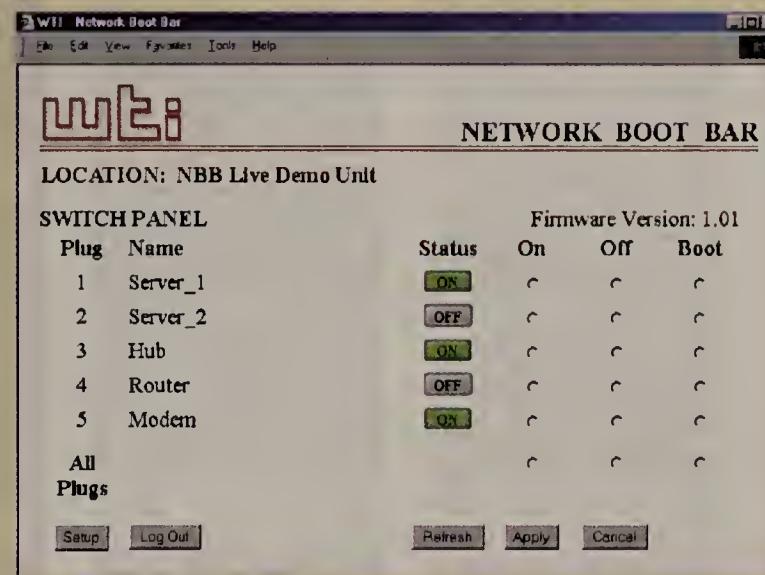
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Mphasis Corporation has multiple openings for the following positions at its offices in New York, NY, Memphis, TN, Houston, TX and unanticipated client sites throughout the U.S.: Programmer Analyst, Software Engineer, Project Manager, Management Analyst, Sales Engineer, Business Development Manager, Finance Manager. Please send resume, salary history and position applied for to 444 Park Avenue South, Suite #503, New York, NY 10016, Attn: H.R. Manager.

Oracle Application Developer for IT consulting company in Fairport, NY. Requires minimum two years experience using SQL and PL/SQL tools to design, develop, troubleshoot and enhance Oracle financial applications, including evaluating and analyzing user requirements, investigating and resolving application issues, developing functional specifications for enhancements, customizing and testing application upgrades, and developing and modifying Oracle financial module forms, reports and operational procedures. Send resume to Morgan Patric, Ciber Inc., 345 Woodcliff Drive, Fairport, New York 14450.

Sys Analyst to convert data from AutoCAD to GE Smallworld. Customize GE Smallworld for Telecōm utility networks. Monitor objects in PNI Network & ensure connectivity. Develop software for CATV Design in GE Smallworld. Design, code, test & implement Web based GIS solution for Cable industry on Java to display location info. of fiber, equipment, maps, & other geospatial data. BS in Comp. Apps. + 1 yr exp. In job duties. Also, 1 yr. exp. on GIS projects in GE Smallworld/ Magik. Comp. Salary. Apply to: IMMO, 11138 State Bridge Road, # 200, Alpharetta, GA 30022 with proof of permanent work auth.

System Analysts needed. Seeking qual. candidates possessing BS or equiv. and/or rel. work exp. Part of the req. rel. work exp. must include 1 yr working w/ Coldfusion & XML. Certified Coldfusion developer preferred. Duties include: Develop systems, databases, & Coldfusion templates; Analyze user needs & implement enhancements. Work w/ Coldfusion, XML, & SQL Server. Send res., ref., & sal. req. to Pyramid Consulting Inc., 5335 Triangle Parkway, #510, Norcross, GA 30092.

Software Engineers to analyze, design develop apps using VC++, C++, VB, Java, JavaScript, XML, HTML, COM/DCOM, ASP, Oracle, IIS, DLL, TCP/IP under Windows/UNIX OS; perform system/functional req analysis; document detailed project spec and review conceptual model with users; provide training/support for related appl software; perform debugging/modifications of existing software. Require: MS or foreign equiv. in CS/Engg. (any branch). High Salary. F/T. Travel involved. Respond to: HR, Mindspan Systems, Inc., 6050 Peachtree Parkway, Suite 240-214, Norcross, GA 30092.

Data Recovery Engineer for computer data recovery and engineering company in Schaumburg, IL. Requires minimum two years experience diagnosing, repairing and recovering damaged data in Windows and Mac environments including recovering data from damaged magnetic and optical media and RAID, file systems, mail and SQL database systems and using C++ to develop software for data recovery procedures. The position is located primarily in Schaumburg, IL with 5% domestic travel. Send resume to David Foster, ActionFront Data Recovery Labs Inc., 1501 E. Woodfield Rd., Ste 201N, Schaumburg, IL 60173.

**NETWORK/NETWARE ADMINISTRATOR** wanted by MRI centers in Houston, TX. Must have degree or its equivalent through proper evaluation, plus exp. Respond by resume only to: Ms. F. Pahlavan, M/B - #10, Universal MRI and Diagnostics, Inc., 3115 West Loop South #2, Houston, TX 77027.

**.Net, C# IT Professionals** Reahum Resources is seeking software architects and software engineers with college degree or equivalent combination of education and experience in computer science/ EE background, to provide consulting services to our clients in various undetermined locations throughout the country. We require 5 yrs of experience including projects involving combination of one or more VB.Net, VC++.Net, C #, SQL 2000. Send resume to Sara, Reahum Resources, 13911 Ridgedale Dr., Ste. 300A, Minnetonka, MN 55303.

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AlphaSoft Services Corp. is a rapidly growing systems integration & software development services provider. We are currently recruiting for the following FT openings in Walnut Creek, CA:  
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Acro Service is looking for MIS, Programmer/System Analysts, Software, Electrical, Industrial or Project Engineers, Tech Recruiters. Bachelor or Master degrees and experience required depending on positions. Please send resumes to [corpbj@acrocorp.com](mailto:corpbj@acrocorp.com) EOE. No phone calls.  
System/Programmer Analysts, Software/Project Engineers or other IT professionals wanted by Imetris, an e-business solutions provider. MS/BS & exp. required. Skills in Oracle, SQL, Java, SAP, PeopleSoft, ERP tools preferred. Competitive wages. Please contact [info@imetris.com](mailto:info@imetris.com). EOE.

Software Dev. Co. req. Software Engineer w/MS & 1yr exp. & Programmer Analyst w/BS & 24 mos. EXP. in foll: Visual Basic, Oracle, PowerBuilder, Sybase, Java, Unix, C++, AS/400, SQL Serv., Synon, Cobol, Lotus Notes, SAP, Java Script, HTML, DB2, Corba, CICS, ILE, RPG, EJB, Siebel, JD Edwards, Weblogic, Rational Rose. Equiv. Deg. & exp also accepted. Travel & Relocation req. anywhere in U.S. Send res. to Attn: Recruiter, Allied Informatics, Inc., 2797 Praire Avenue, Suite 16, Beloit, WI 53511.

Optimal Solutions Integration, Inc. has multiple openings for SAP and i2 Consultants, Software Analysts and System Analysts. Please send resume with salary history and requirements to Optimal Solutions Integration, 8445 Freeport Parkway #240, Irving, TX 75063. Open to Green Card holders or US Citizens.

Internet company seeks PhD Research Engineers responsible for innovative research. Interested applicants should send resumes to: K Wolfe; 1501 Salado, Mt. View, CA 94043. Visit [www.google.com](http://www.google.com) for additional information.

Meridian Technologies looks for IT professionals for various positions in the area of Oracle, SAP, SQL, Java, Web applications, Unix, etc. Candidates must have BS or equivalent with some IT experience. Travel required for some positions. Please contact [marali@meridiantech.net](mailto:marali@meridiantech.net). EOE.  
ANA Associates has openings for software engineer, system/programmer analyst. Qualified applicants must have BS with 1-yr exp. Skills in Java, VB, Oracle, SQL, web technology are strong plus. We are small but stable. Competitive wages. Apply at [anees@anaconsulting.com](mailto:anees@anaconsulting.com). EOE.

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**Software Analyst** required by IT company head office in New Jersey, for an opening in Greensboro, NC for now, but with various unanticipated locations within the U.S. Applicants must have bachelor's degree in Computer Science or Electronics Engineering (or foreign equivalent) with min 5 yrs overall exp. Required skills includes strong BroadVision (6.0 and above), ABAP/4 (IDOC/BDC/RFC/BAPI, SAP 4.0B and above), C++, JAVA, and XML on UNIX. Must be able to design and develop SAP interfaces using ABAP/4, IDOC's , BAPI with BroadVision Retail Commerce 6.0. Must able to use Dom/SAX Parser, C++ and BroadVision API to create back-end Unix services. Please send resumes to P. Maggon, Artech Information Systems, 60B Columbia Road, Morristown, NJ 07960.

**Software Engineers** to provide in depth analysis, design, development and testing services for database development projects; responsible for project scoping, planning, time and cost schedules, quality of deliverables; study and evaluate new technologies and methodologies; provide technical and business guidance for complex user problems; guide team by providing methodologies to be followed; interact with clients on project related issues. Require: Master's degree or its foreign equiv in CS/Engineering (any branch) or related field. competitive salary, F/T. Travel involved. Resumes to: HR, Fourth Technologies, Inc, 1333 Lawrence Exp way, # 455, Santa Clara, CA 95051.

**Programmer Analyst**. Sought by Englewood Colorado consulting company to work in various unanticipated locations throughout the U.S. Analyze, plan, develop, test and document computer programs including network communication programs. Evaluate user requests and software program requirements for new and modified programs. Write specifications, code, test and debug computer programs. Customize hardware and software to client needs. Use of Oracle 8i, PowerBuilder, Gupta/Centura , SOL Windows, PL/SOL, C, C++, Cobol, FoxPro, SOL Server and Windows NT. Reqs. Bachelor or equivalent in Computer Science, Computer Engineering or related degree. Plus 2 years in the job offered or 2 years in a related occupation, including Software Programmer, Technical Consultant or Analyst Programmer. \$76,000/year, 40/hrs/wk, 8AM-5PM. Respond by resume to WORKFORCE DEVELOPMENT PROGRAMS, PO Box 46547, Denver, CO 80202, and refer to Job Order No. CO5064310.

**Systems Analyst (NYC)**. Interface w/finl institutions in US to gather systm info incl capacity of existing sysrns. Determine user & systm reqmts, ascertain internal operating procedures & determine proper sysrns modifications to automate or improve existing sysrns taking into account comp systm capabilities, workflow, & scheduling limitations. Write sysrns reqmts & interface w/offshore prgrms in s/ware dvlpmt. Oversee rollout of sysrns in US. Utilize PL/SOL, VB, Sybase & VSAM. Req Bach or foreign equiv in Engg or Comp Sci + 2 yrs exp in job off or in related job of Info Syst Director. Related exp must incl PL/SOL, VB, Sybase & VSAM in banking or securities trade envrmt. Fax resume to: Ilya Bykov, NEE Consulting, Inc. @ 212-587-1924.

**Programmer/Analyst** needed for Software Development, Services & BPO firm located in Burlington, VT. Job duties include: Analyze, develop, code, test and implement computer software applications/systems in client server environment for clients located along the east coast. Use Oracle, Progress, Windows NT and UNIX. Perform work as part of a team under direct supervision. Applicant must have B.S. degree in Computer Science, Business, Mathematics or Engineering. Applicant must also have 2 yrs. exp. in the job duties described above or in any computer related occupation which includes the skills listed above. 40hrs/wk, 8:00am-5:00 pm, Mon-Fri, \$52,936/yr. Send resume & cover letter to: Vermont Dept. of Employment & Training, Job No. 612506, P.O. Box 488, Montpelier, VT 05601-0488.

**S/W Engineers** to analyze, design, develop apps using C++, Java, HTML, JScript, JDBC, XML, ASP, JSP, Visual Source Safe, SQL Server, Rational Rose, Oracle, Access under Windows/UNIX OS; perform system/functional req analysis; document detailed project specs and review the conceptual model with users; provide training/ user support for related appl software; perform debugging/modifications of existing software. Require: M.S. or foreign equiv. in CS/Engg.(any branch) with 1 yr exp in IT. High Salary. Travel involved. F/T. Positions available in Elgin, IL and Lower Gwynedd, PA. Resumes to: HR, Fourth Technologies, Inc., 1108 N. Bethlehem Pike, Suite 8, Lower Gwynedd, PA 19002. Specify location desired on resume.

**Computer**. Moneyline Telerate a leading financial information services firm seeks VP/Global Trading Systems for NYC office to direct /develop software strategies for management of data distribution systems. Rpts directly to CTO. Req'd BA in CSc/EE/ related area, 3 yrs exp. in building global scalable real time equity and/or fixed income systems, w/full life cycle dvlpmt from inception to delivery, initiating devising, monitoring, reviewing strategic plans, & performing gap analysis to ensure that dvlpmt projects meet long-range financial goals. 7 years exp req'd w/IBM MQ Series, Tibco TIB & Rendezvous, Hawk System, Triarch, SmartSocket, IP multicast, STAMP/FIX/JMS & mathematical optimization algorithms, data compression algorithms, data encryption & security on distributed systems; in overseeing through intermediate management the design & creation of detailed software system specifications; & in researching/implementing best practices in dvlpmt strategies. No search firms. Send e-mail w/resume & comp rqmts to recruiting@moneyle.com

**Research & Applications Specialist** - Dvlp large complex embedded real-time systems & commercial enterprise systems. Plan & direct dvlpmt, installation, maintenance & modification of mission-critical applics on large multi-user systems. Lead & provide research & engg direction. MS + 5 yrs or PhD + 2 yrs exp reqd. Must have 1 yr exp in C, in C++ & Java, 6 mos w/SAGE Integration technologies, 1 yr in DSP using VxWorks, 1 yr in enterprise architectures, 1 yr w/source control dvlpmt tools, & 6 mos in dvlp algorthms specific to resource optimization techniques.

**Software Architect** - Research, dsgn, dvlp & test operating systems-level s/ware, compilers & n/network distribution s/ware for embedded real-time & enterprise applics. MS + 3 yrs, BS + 6 yrs or PhD + 1 yr exp reqd. Must have 1 yr exp w/each of SAGE Integration & SPI technologies; 2 yrs combined exp w/embedded systems dvlpmt methodologies & real-time operating systems frameworks incl. VxWorks, PSOS.

**Competitive Salary & benefits**. Apply to: Human Resources, Tandem Systems LLC, 12401 62nd Street North, Unit 201, Largo, FL 33773-3786.

**Technical Operation Specialist** wanted by Nursing & Rehab Ctr in IL to provide tech support to Info Systems staff, assist users to resolve computer related problems such as inoperative h/ware or s/ware. Req Assoc Deg or equiv in Comp Sci. Will accept equivalency evaluation of 2 yrs of academic studies toward Bach in Comp Sci, or Training &/or Exp in Comp as equiv in lieu of Assoc deg in Comp Sci. Respond to John Marc Sianghio, Administrator, Harmony Nursing & Rehabilitation Center, 3919 W. Foster Ave, Chicago, IL 60625. No calls.

**Computer**  
eTechnosoft Corporation has multiple openings for Programmer/Analyst, Software Engineer, Project Lead/ Managers. Send resume to: 8700 W. Bryn Mawr Avenue, Suite 800 South, Chicago, IL 60631 or email to: resume@etchnosoft.com

**Software Engineer** (St. Louis, MO) Develop/test/impl. large-scale/multi-tier RDMS applying OOD in busi.functionality. Development tasks include: server side busi logic modules using Unix C/C++ & SQL; server utilities on UNIX using Korn Shell/PERL scripts; front-end GUI appls. using VB / VC++; statistic modules w/ math modeling & algorithms; tuning/testing (plan & unit/system/regression phases) using Rational Quantify/Purify/PureCov; and tech spt. appls. on Access. Require MS plus 1 yr. exp.

**Sr. Programmer Analyst** (Sys.Admin) (St. Louis, MO) Architect/impl large-scale infrastructure/middleware projects. Tasks include: analyze/admin/tune F10K/E10K Sun Servers in clustered env.; architect/impl. portals & appl. servers fr. Websphere/Weblogic; impl./tune middleware using MQSeries & RetrievalWare; impl. corp. LDAP in Oracle, DB2 on Solaris, Linux, AIX, Win2000/NT & HP-UX; and architect fraud detection env. Require BS plus 2 yrs. exp.

**Programmer (Test) Analyst** (Chicago, IL) Design/develop automated testing process involving Legacy System in mainframe/client-server in WinNT/2000 env. Duties are: analyze busi./sys. reqs./rules and formulate test plans; perform sys./user acceptance and regression testing in mainframe EDI env. using FILE-AID, ATTACHMATE and VAN-TIVE; write SQL queries on data in LASR-DB2, MOR-SYBASE, ADAPT-ORACLE and WINRUNNER-Access; develop auto test scripts using TSL and batch tests in CR and DR env. Requires BS plus 6 mon.exp.

**Full time w/ competitive salary.** Resume to: C. Nottingham, HR, NetEffects, Inc., 500 Chesterfield Center, Ste350, St. Louis, MO63017 NO CALI/EOE

**Firmware & H/W Eng** (Westhampton, NJ) Write drivers for SmartAntenna, ATSC, SCDMA/DOCSIS, DAVIC, OCAP, DTV. Debug h/w & s/w for OCAP STB device designs using JTAG, Partnet ET-II, Cygwin, SmartAntenna, CMTC/CM, Matlab, VERA/HDL, Synopsis, OpenTV & DTV. Write FEC (Reed Solomon, Trellis, Interleaver) algorithms, test benches & behavior mdls to verify h/w & chip design. Bach's deg in Comp Sci, Physics or Elect Engrg reqd + 3 yrs exp in job offered. Snd resume to MECA/Panasonic Semiconductor, 550 South Winchester Blvd, Ste 300, San Jose, CA 95128, Attn: Todd Windley, SG

**Vignette Content Management**. Seeking Vignette developers with strong Java skills and experience creating Detailed Design Documents for Vignette. Java Developers. Design Java Business Component, Action Component and Presentation Component using OOD Techniques and state diagrams using UML. Technical Services Manager-Healthcare. Individual to participate in developing and implementing self provisioning web-services based process automation solutions for healthcare payer industry. Must understand third party requirements related to data storage, transmission and transactions including claims adjudication. Will work with IT staff and end users. Submit resume and references to HR Trac USA, 50 Carnegie Drive Piscataway NJ 08854

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**SR. VISUAL BASIC CONSULTANT**

Analyzes & evaluates existing or proposed software sys. Dvlpms, implmnts & improves programs, sys. & related procedures to process data using in-depth knowledge of the software dvlpmnt life cycle. Encodes, tests, debugs & installs operating progs. & other sys. software utilizing advanced knowledge of Vis. Basic prog tools. Bach. degree (or equiv.) in Comp. Sci., Math, Engng, Bus. or Commerce + 3 yrs exp. in position offered or as a Software Engr, Prog. Analyst or Sys. Analyst reqd. Exp. must incl: (1) Oper. Sys: Windows or UNIX; (2) Prog. Langs: Vis. Basic, ASP & XML; & (3) Databases: Oracle or Sybase or SQL Server. High mobility preferred. 40 hrs/wk, 8am - 5pm, \$64,240/yr. Qualified applicants submit resume to: Mon Valley Regional CareerLink, Attn: Actg. CL Program Supervisor, Donora Industrial Park, 570 Galiffa Drive, Donora, PA 15033. Please refer to Job Order No. WEB 380917.

**Programmer Analyst** needed for IT consulting firm located in Burlington, VT. Job duties include: Develop computer applications for clients located throughout the eastern U.S. specifically installing, configuring, and integrating the Siebel software package with other systems of the client including mainframe, SAP, and Oracle. Connect the newly developed system to the web at client's request. Work as a part of a team under direct supervision. Applicant must have B.S. degree in Computer Science, Business, Mathematics or Engineering. Applicant must also have 1 yr. exp. in the job duties described above or in any computer related occupation which includes the skills listed above. 40hrs/wk, 9:00 am-5:00 pm, Mon-Fri, \$52,936/yr. Send resume & cover letter to: Vermont Dept. of Employment & Training, Job No. 612502, P.O. Box 488, Montpelier, VT 05601-0488.

**Software Engineer** - Ft. Lauderdale, FL - to research, design, develop, implement and test application software in C/C++ and DataCore SAN-central DevSuite (SCDS) in Windows environment for storage management software; write Snap-Ins using COM in Microsoft Management Console; SCSI, TCP/IP and UDP protocols; I/O subsystems, software drivers, operating systems and storage area network. M.S. in Communication Engineering or the equivalent and one year in job offered. Apply with resume to Principal Factotum, Datacore Software Corporation, 6300 NW 5th Way, Fort Lauderdale, FL 33309.

**Computer specialist**, Naples, FL. 40 hrs/wk, 8am-5pm, \$15/hr. Req's HS education, one yr training in computer related field & two yrs exp in job offered. Work on PC network in insurance office. Train staff on all hardware & software. Interface on all computer related issues. Repair & service office equip incl printers, fax, copy machines. Verifiable references. Send resume to Agency for Workforce Program Support, P.O. Box 10869, Tallahassee, FL 32302-0869; Ref: JOFL #2469123.

**Senior Systems Software Engineer** (Milwaukee, Wisconsin) Research, design, develop, test & support telecom & data processing applications & systems. Apply working knowledge of Next Generation Softswitch & Media server systems to the development of call center & VoIP based products & features addressing software architecture using UML/OOD methodologies incorporating AIN service concepts. Implement software based on SS7, ISUP, TCAP, H323, H248, SIP, E1, T1 & ISDN signaling protocols & VoIP technologies for Real time sub-systems using UNIX/LINUX, Windows NT/2000, C, C++, JAVA, VC++, SQL; PVCS/Clear Case; SDL/FSM; Protocol Analyzers. BS/MS in Computer Science, any Engg, or related field, & relevant exp. req'd. Send resume to Vivian Fernandes, MBT International, Inc, 5215 N. Ironwood Rd, Ste 106, Glendale, WI 53217.

**SYS/NETWK ADMSTR.** Perform sys & netwk adminstrn of Unix servrs. Evaluate & recommend HW/SW reqs; & project planning & executn mgmt. Trblshoot & handle HW/ SW rtd probs. Setup & maintn SAN & Clusters for hi availability. Dvlp tools for perfmnc & admin efficiency. Setup & maintn remote installatin servr. Administr E-test envirnmnt; test executn of Logical Volume Mgr on Advnc File sys & TruClusters; & sys backup & restoratn. Req: Bach degr in CS, EE or ME + 3 yrs exp in job offrd or as Unix/Sys Admstr or Unix Engr + spec reqs of Unix sys & netwk adminstrn, Unix servr SW/HW, Unix Security Mgmt, HP-UX sys & netwk adminstrn, HP-UX SW Configuratin Mgmt sys, write code & script for tools dvlpmnt, SAN, Volume Mgr & Cluster. Sal: \$78,280/yr. Loc: Nashua, NH. 8am-5pm, 40hrs/wk. Send 2 copies of resume/letter of application to: Job Order # 2004-004, P.O. Box 989, Concord, NH 03302-0989. Must have proof of legal authority to work in U.S.

**PROGRAMMER ANALYST**

Hexaware Technologies Inc. is seeking a Prog. Analyst to work in Lisle, IL to anlyz, dsgn & implem. sftwr systs & applcns. BS in Comp. Sci., Comp. Info. Syst or Electronics Engrg + 2 yrs exp. as a Sftwr Engr, Prog. Analyst or Constnt. reqd. Must have exp. utilizing Obj. Oriented Anlys & Dsgn, SQL Serv. & Oracle Serv. RDBMS, VB 6.0 for syst analys & dsgn, Oracle Forms 4.5/5.0, Oracle Rpts 2.5/3.0 & Crystal Rpts. High mobility preferred. Resume only to: R. Ravindran, Dir.-HR, Hexaware Technologies, Inc., 4343 Commerce Ct., Ste. 618, Lisle, IL 60532.

**Software Engineers** to analyze, design develop apps using OO Methodologies, VC++, C++, Java, HTML/DHTML, XML, XSL, SQL, Perl, Oracle under Windows/UNIX OS; perform project scoping, planning time/cost schedules, quality of deliverables; perform tune up to improve system performance; study, evaluate new tech/methodologies; provide technical guidance for complex user problems. Require: MS or foreign equiv. in CS/Engg. (any branch) & 1 yr exp. in IT. High Salary. F/T. Travel involved. Resumes: HR, Unilinx, Inc., 4625 Alexander Dr., Ste 110, Alpharetta, GA 30022.

**Director**, Skyris Networks, Cambridge, MA Will research, design, develop & manage, networking protocol software, & commercial deployment of distributed applicns, based on the Skyris™ Protocol. Requ: Bachelor's Degree in Comp Sc; 2yrs exp as Systems Software Engr; knowledge of Distributed Systems & Networking technologies, Adaptive Communication Environment, Distributed Hash Tables; & domain expertise in Peer-to-Peer technologies, markets, & "The Skyris Protocols and System". Send resume & proof of authorization to work permanently in US to: Chris Weiss, Office Manager, Skyris Networks, Inc. & Stirling Bridge, 59 Pleasant Street, Cambridge, MA 02139. No phonecalls.

**Sr. Sys. Analyst** for software dev., planning, project & team mgmt. Perform system/ req. analysis, review client b/z sols., & end user needs. Perform database design using ERWIN, resource allocation & develop web/ eCommerce systems using ASP.Net, C#, Active Server Pages, VB.Net, Visual Basic 6.0, VB Script, Java Script, SQL Server 2000, Com+, XML, XSL, Acrobat PDF, Rational Rose, ER-Win, Windows 2000/ WinNT. Customize, upgrade & maintain software packages: Ebix-Asp and Ebix-Exchange. Evaluate code against stds. & maintain proj. docs. BS in Comp. Appns. + 2 yrs. exp. in job duties. Comp. salary at prev. wages. Apply: HR, EBIX, 5 Concourse Parkway, # 3200, Atlanta, GA 30328 with proof of permanent work authorization.

**Sr. Architect, Information Systems.** Provide guidance & expertise on software design, dev. & architecture in multiple areas w/ primary focus on internet tech., Siebel CRM implementation, Enterprise Application Integration & Security & Identity Mgmt. tech. Possess in depth technical knowledge & dev. level skills in prgr. languages (Java, C++, C), Messaging & EAI technologies etc. Req. M.S. Comp. Sci. & 1 yr of exp in job or 1 yr exp as a Sr. Software Engineer. Send ad & resume: Kyle Foster, Amgen Inc., One Amgen Center Dr., Thousand Oaks, CA 91320-1799 (jobsite).Include Ad#03-488FV.

**BUSINESS ANALYST**, Keller, Texas. Require Bachelor's degree in a technical discipline such as engineering, physics or math & MBA, data modeling and data analysis experience, & graduate course work/project or previous work experience using statistics software applications. Send resume to Corning Cable Systems, LLC, Attn: Human Resources Manager, 9275 Denton Highway, Keller, Texas 76248. NO PHONE CALLS PLEASE.

**Vice President, Network Engineer:** Must have bachelor's degree in business or computer information system. Location: Wilmington, DE. Fax CV to Brandywine Medical Management at 302-984-2575.

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118 Turnpike Road, Southborough, MA 01772  
Phone: (508) 460-3333

**TO SEND E-MAIL TO NW STAFF**  
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Carol Lasker, Associate Publisher/Vice President  
Jane Weissman, Sales Operations Coordinator  
Internet: clasker, jweissman@nww.com  
(508) 460-3333/FAX: (508) 460-1237

### New York/New Jersey

Tom Davis, Associate Publisher, Eastern Region  
Elisa Della Rocco, Regional Sales Manager  
Agata Joseph, Sales Associate  
Internet: tdavis, elisas, ajoseph@nww.com  
(201) 634-2300/FAX: (201) 634-9286

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Donna Pomponi, Regional Sales Manager  
Internet: dpomponi@nww.com  
(508) 460-3333/FAX: (508) 460-1237

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Don Seay, Regional Sales Manager  
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### Fusion

**Microsoft**

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last year, a sure sign it is transforming from high-flying tech Titan to blue chip.

The transformation was reconfirmed at the company's annual financial analyst confab in July where annual new product demonstrations were replaced by staid assurances of "boosting the business value of software" and talk of revenue dips in fiscal 2004.

"The company is maturing and in general [CEO Steve] Ballmer and [Bill] Gates are a lot more careful," says David Smith, a vice president at Gartner. "They maintain an edge, but they have softened it a bit."

But Microsoft isn't softening as a technology powerhouse. It has \$51 billion in cash and a \$6.9 billion research-and-development budget focused on everything from servers to the XBox game system. Its client operating system and Office suite each own more than 93% of their markets; both maintained sky-high operating margins in the company's 2003 fiscal year, ended in June; and together they supplied 62% of revenue and 98% of profits.

Such numbers make old habits die hard, so not surprisingly, the company's growth plans are familiar. This was evidenced by a reorganization late last year that created the Windows Core Operating System Division, which will focus on development of the client and server operating system.

Microsoft is looking to capitalize on its desktop dominance and emerging server empire, which are core to a new generation of products under the Longhorn banner. The division will meld the contents of Microsoft's software portfolio, integrate it with other platforms on the back of XML, and, according to a recent report by Goldman Sachs, potentially initiate the largest upgrade cycle in the company's history.

"The simple summary is that we believe that we're just at the beginning of what we can do with software," Chairman and Chief Software Architect Bill Gates said in October.

**Feeding the cash cows**

Although Longhorn is the future, the technology is not expected to be generally available for at least two more years. In the interim, Microsoft must nurture its client operating system, its

**Trials and tribulations**

**Microsoft faces a number of challenges with its major revenue-producing products, and with keeping its corporate customers secure, happy and away from Linux. Here is a look at some of the issues going forward.**

Challenges	Strategies	Threats
Microsoft must find new ways to generate new customers, upgrades.	Longhorn is the bet, but think devices, devices, devices — handhelds, PDAs, tablets, GPS and scanners.	Linux/Open source. Microsoft feels heat in Europe and with new businesses. Gartner says Windows could lose 5% to 10% market share to alternative operating systems. The bottom line is David only nibbles on Goliath.
Approaching ceiling in server operating system market.	Integration of Windows server and server applications. Exchange and SQL Server are leading growth, SharePoint and Jupiter are promising.	Linux/Open source again, but a bigger threat here.
Management of platform.	Dynamic Systems Initiative is a long-term, ill-defined bet to manage Windows from the application level on up.	IBM, HP, Sun and others are riding on the utility computing bandwagon.
Security bugs gnawing at customer resolve.	Improve patching tools and tune system defaults. Security is said to be job No.1, but the results are sketchy.	Slow progress means customers continue to beat up Microsoft on this issue, or worse, quit fighting and go somewhere else.
Licensing 6.0 program still in disarray.	Convert customers whose old contracts are due to expire. Attraction is additional services and support.	Licensing could be final straw for frustrated users.

server operating system and Office businesses, the only three of Microsoft's seven business units turning a profit.

Revenue growth in its client operating system and Office businesses has been positive but anemic over the past couple of years, but the company projects single-digit declines for both business units in 2004 compared with 2003. Meanwhile, the company's Windows Server business might be hurtling toward the same crossroads.

On the client operating system side, the plan is to move existing users to older systems and find new markets for its operating system. There are 350 million PCs running Windows NT or 9x that Microsoft wants to convert to Windows XP, a goal laid out by Jim Allchin, group vice president of the platforms group, in July. Many of those converts might be forced because Microsoft has ended or is about to end support for those legacy clients.

The company also hopes to put an operating system in other types of computers, including handhelds, tablet PCs and smart devices, and create multi-PC networked households that use the Media Center operating system as a hub, according to Allchin.

On the server operating system side, Microsoft owns almost 55% of the market, though isn't likely to grab more than another 10% overall, says Al Gillen, an analyst with IDC. He estimates that the overall server operating system market

will show a compounded annual growth rate of 9.1% over the next five years, identical to that of 1997-2002.

"That is the sign of a maturing market," Gillen says.

Lately, SQL Server and Exchange have carried the load in Microsoft's Server and Tools business unit with double-digit revenue gains quarter by quarter. Microsoft, which increased head count in its server sales force by 12% last year, is building on that strength with Exchange 2003 and the planned release next year of SQL Server Yukon and Visual Studio .Net Whidbey development tools.

**Longing for Longhorn**

But the focus for 2004 is further development of Longhorn, Microsoft's "big bet on galvanizing the next big breakthrough — even bigger, perhaps, than the first-generation Windows release," according to a memo Ballmer sent to employees in June. The statement was backed up in October with the release of beta code more than two years before product shipment, the earliest Microsoft has ever let independent developers evaluate new code.

Longhorn's first incarnation is the client operating system, due in 2006, but Longhorn includes servers, development tools, Office and even MSN, the company's online property. Longhorn is designed not only to blur the lines between applications and

data on desktops, servers and the Internet but eliminate them and make the systems look like one.

Longhorn has several key elements that support that effort, including Avalon, a presentation system for new applications; Indigo, an XML-based integration bus for clients and servers; WinFS, a platform-wide file system; and WinFX, a new set of APIs.

Those underpinnings grew out of Microsoft Research and were fueled by Microsoft's massive R&D spending, which topped \$23 billion over the past five years.

The desire to create the Longhorn "fat client" is a direct attack on rivals such as IBM and Sun that want to break Microsoft's desktop stranglehold using Java Application Servers, portal interfaces and browser-based clients.

Longhorn also is intended to thwart Linux and open source. Microsoft wants to fight the upstarts with a collection of integrated software as opposed to individual features and price on the client or server.

"If Microsoft pulls off Longhorn the rewards are potentially significant, but that's a big 'if,'" says Neil Macehiter, research director with Ovum.

**Rivals sense the vulnerability**

A recent SG Cowen survey showed that of respondents planning to increase their use of Linux in the next one or two years, more than 70% of current Linux sites planned to increase reliance on it and 29% planned to deploy it for the first time.

IBM has dedicated \$1 billion to Linux development, Novell bought SuSe Linux for \$210 mil-

lion, Sun recently released its Java Desktop System built on Linux, and Oracle earmarked \$150 million to sway independent software vendors to develop Linux-based Oracle applications.

"If Novell can figure out how to glue its services on to Linux they can compete seriously with Microsoft," says John Enck, an analyst with Gartner. "If you get eDirectory rather than OpenLDAP, that is something real."

But Longhorn's success hinges on Microsoft polishing up its reputation.

"Unless Microsoft solves its image problem, the technology doesn't matter," says Rob Enderle, president of the Enderle Group. "Microsoft is perceived as a company you cannot trust, and once you have that foundation everything flows in that direction."

The European Union's antitrust case against Microsoft is reviving the monopoly tag and fueling open source software in Europe and Asia. That lawsuit could cost Microsoft \$3 billion on top of \$1 billion it paid in legal settlements in fiscal 2003.

Licensing and security flaps of Microsoft's own creation are fueling customer angst and resentment.

The company's controversial 2-year-old Licensing 6.0 plan and its companion Software Assurance annuity-licensing program has only attracted 30% of the user base, according to The Yankee Group. Designed to eliminate confusing licensing options, the program instead raised fears among customers about steep price increases.

Of the 70% not signed up, 42% have Licensing 5.0 agreements

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# Microsoft shelves aging software

■ BY JOHN FONTANA

Microsoft this week will render "obsolete" Windows 98 and Office 97, the first two products in a line of aging software that will see support end this year.

The move will force some corporate users to make upgrade decisions or opt for running unsupported software, though observers say Microsoft has done a commendable job supporting old software.

"But that means a lot of this software is still in use," says Dan Kusnetzky, an analyst with IDC. The research firm says Windows 95, 98 and ME, which will be obsolete at year's end, account for 100 million copies of the operating system in use today.

Other products on the chopping block include SQL Server 6.5, Windows NT 4.0 Workstation and Server, and Internet Information Server 4.0. Versions of Microsoft's business software, Great Plains, Navision and Solomon, along with its Small Business Server 7.0, also will be obsolete by year-end. In March 2005, Windows 2000 Professional, Server and Advanced Server will hit deadlines for mainstream support, and users will have to pay for

incident and hot-fix support. Security fixes will be free.

The list means network executives will have to decide if they want to step up to the latest versions, contract with a third-party that supports obsolete software or run unsupported, which some analysts say presents legal liabilities.

"The risk to customers who remain on a product that is no longer supported is that a situation might arise where a security vulnerability is discovered which cannot be fixed," says Andy Erlandson, director of security product support services for Microsoft.

The company instituted its Support Lifecycle policy 14 months ago to provide consistency and predictability, although the dates have been extended on some products such as NT and Visual Basic 6, Erlandson says.

The lifecycle plan mandates five years of mainstream support from the date a product is released followed by two years of fee-based extended support. Mainstream support includes no-charge incident support, paid incident service, support charged on an hourly basis and hot fixes. Extended support, which is in-

cluded as part of Microsoft's Software Assurance maintenance plan, might include service charged on an hourly basis and paid hot fixes. Security fixes are free throughout the life cycle of a product.

"We have been watching this product life cycle carefully," says Matthew Bailey, LAN engineer for CSK Auto, which operates Checker, Schucks and Kragen auto parts stores.

"We want to move before patches are no longer available. It's important for us because we run a small shop and rely on our Premier support contract," says Bailey, who is one of seven IT staff managing 800 desktops and 100 servers at the Phoenix company. He adds that 10% of the company's servers run on NT 4.0 but will be replaced on the company's normal replacement cycle.

Observers say users don't have to panic in the face of support deadlines.

"The fact that support is expiring is significant, but the question people have to ask is 'Have they needed Microsoft's help in supporting these systems or has the application been stable enough not to need support?'" IDC's Kusnetzky says. "Another question

is, 'Does this system talk to the network?' If not, it is less of a security issue."

If an unsupported system or application is connected to the network, some say it presents real liability issues.

"An unsupported environment is not the technical concern it

was four or five years ago, but there are larger ramifications such as the risk of liability," says Laura DiDio, an analyst with The Yankee Group. "What about customers or business partners that might suffer lost, altered or hijacked data because of your unsupported systems?" ■

## IBM expands four-way offerings

■ BY JENNIFER MEARS

Rapsheets, which provides online criminal records searches, was growing nearly 25% per month and was looking for ways to beef up its infrastructure to support the demand on its expanding database. After considering deploying multiple 2U, two-processor servers, the Memphis, Tenn., company opted to deploy IBM blade servers to run customer queries.

"Management of those 2Us is all the difference in the world because they have their own internal hard drives," says CTO Keith Grimes, explaining that the blades have no internal hard drives and boot directly off his storage-area network, which supports a database of about 175 million individual records.

Today, the company runs 10 of IBM's two-processor Intel HS20 blades, and Grimes says he's awaiting the new four-processor systems that IBM announced last week and expects to roll out next month.

That system, the BladeCenter HS40, is expected to run 2-GHz, 2.5-GHz and 2.8-GHz Xeon MP processors. It will fit side-by-side in IBM's 7U BladeCenter Chassis with the Intel-based two-processor HS20 server, along with the PowerPC-based JS20 blades that should be available in March. IBM has yet to set pricing for the blade.

The blade comes more than a year after HP introduced its four-way BL40p, but analysts say IBM might have an edge because of the more compact form of the HS40. According to HP's Web site, 12 BL40p blades can fit in a 42U rack, while Richard Rudd, product manager for xSeries at IBM, says users can pack 42 HS40 systems in the same size rack.

Also last week, IBM introduced an updated four-way system to complement its existing four-way x360 rack-mounted server. The x365, which starts at around \$7,000, runs on the same Xeon MP processors as the HS40 and includes six internal hard drives, compared with just three on the x360. Memory is also expanded from eight DIMM slots on the x360 to 16 on the x365.

The x365 is an upgrade to the x360 that was rolled out almost two years ago and provides more storage and memory capacity for bigger workloads in the same 3U enclosure. In the past, customers that needed more storage would have had to either go with a bigger system that offered more internal storage or take up data center space by attaching an external disk array, Rudd says. ■

## Microsoft

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signed two years ago to initially avoid 6.0. Those 5.0 contracts now are coming up for renewal and Microsoft needs converts to new contracts. The company derives nearly a third of its overall revenue, which totaled \$32 billion in its 2003 fiscal year, from money paid upfront for licensing and other products and services that are delivered at a later date — so-called unearned revenue.

"If Microsoft can get 20% to 25% [of those whose contracts are up for renewal] to sign up for Software Assurance that would provide a good impact on revenue," says Laura DiDio, an analyst with The Yankee Group.

However, early returns are not promising, as unearned revenue was off \$768 million between June 30 and Sept. 30, 2003. Microsoft now is trying to entice holdouts with new support and services added to Software Assurance, since there won't be many upgrades.

Microsoft's effort to win licensing converts has not been helped by security vulnerabilities, including the Blaster worm, whose effect was so bad that CFO John Connors cited it during the October earnings announcement as one reason the company was unable to close some sales.

Over the past few years, the company has trained 11,000 of its developers in writing secure code. Now it is overhauling its patch management tools and

resetting defaults in its software to err on the side of security. It has invested \$100 million into its Trustworthy Computing initiative in the Windows division to develop its Next Generation Secure Computing Base, a Longhorn technology that combines hardware and software to secure the operating system.

### Integrate, interoperate

Addressing such problems is crucial for Microsoft because large customers are tripping on security and licensing issues at a time when they want to better integrate Windows into enterprise infrastructures.

"Microsoft can't take over the world although they wish they could," says Fred Wettling, infrastructure architect for global engineering firm Bechtel. "Microsoft's evolution must help move the industry closer to product interoperability. They need to drive toward more openness."

Microsoft is relying on XML as the answer. Over the past two years, the company has worked with IBM to develop and promote Web services standards. Microsoft has opened more of its source code to partners, governments and universities. The company recently said it would offer royalty-free the XML schemas in Office, which is code that describes how a document is formatted.

"Is what they're doing benevolent?" Wettling asks. "Probably not. But it is part of an evolution that on some level will help end users."

Next week: Microsoft looks for new revenue opportunities. ■



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## BackSpin

Mark Gibbs



# A dozen New Year's resolutions

**W**as that the first of the year that went rushing toward the horizon with its tail on fire? I'd better make some New Year's resolutions pronto ... hmm, let's see ...

**Resolution 1:** I will stop being surprised at how ineffectual and disorganized — how just plain awful — customer service is for AT&T Wireless. I would adopt the same policy for Verizon's customer service but I dumped them in December thinking that I would rid myself of a source of stress. It turned out that I was simply exchanging one source of stress for another.

**Resolution 2:** I will never buy another cell phone made by LG ever again. How can anyone make a cell phone that doesn't organize its telephone directory alphabetically?

**Resolution 3:** I will always arrive at the airport no less than two hours before my flight, wear shoes that can be slipped on and off, remember not to carry my nail clippers in my roll-on bag and learn to relax and be resigned to being treated like a cross between diseased cattle, a criminal and an idiot.

**Resolution 4:** I will not expect that my flights will be on time or that in-flight food will be edi-

ble. I will expect to be sandwiched between a very fat person and a woman with a screaming baby, in front of someone who uses the back of my seat to get up just when I have dozed off and behind someone with serious hygiene issues.

**Resolution 5:** I will stop getting angry over spam [Yeah, right — ed.] and I will stop hunting down and trying to educate organizations [Ditto — ed.] such as DeVry University that uses spam but should know better. And I will never have anything to do with Phoenix University, the Brooks Institute, Columbia House, X10, Omaha Steaks, The New York Times, Perfumania and Hooked on Phonics, which all spam shamelessly and with wild abandon.

**Resolution 6:** I will not write about The SCO Group and its ridiculous lawsuits again until something worth writing about happens. Maybe something like Darl McBride realizing that such a thing as ethics exists.

**Resolution 7:** I will be nice to people who forward messages filled with stupid, mawkish sentiments that end with exhortations to "forward this to 10 friends or you will have bad luck for all eternity." I will just delete the message and add the sender to my blacklist.

**Resolution 8:** I will get up from the computer every 15 minutes so my legs don't atrophy. I will

take a break at least every eight hours. I will get my vision checked once a year. I will sit up straight so my back doesn't fossilize into a curve. I will stop playing solitaire. I will stop compulsive browsing.

**Resolution 9:** I will apply every security "update" that Microsoft generates even though I know it will occupy more time than I can afford. And I will stop moaning about having to reboot after every patch.

**Resolution 10:** I will stop being so critical about Microsoft's lousy, bug-ridden code and wild unnecessary feature creep, the company's insane drive to change application user interfaces for no good reason, and its bizarre and overcomplicated architectures that unnecessarily lock us into the bowels of network hell ... oh, darn.

**Resolution 11:** I will stop checking e-mail compulsively. I will check it twice a day. Well, maybe four times. And before I go to bed. And ... oh darn again.

**Resolution 12:** This year, I will get a life. I will stop obsessing about computers and online stuff and start doing other interesting things that aren't digital. Wait a minute ... there isn't anything more interesting! Some parts of 2004 look like they might be a lot like 2003. Oh well.

*Your resolutions to backspin@gibbs.com.*

## Commentary

By Adam Gaffin

### A question of semantics

As information continues up the OSI stack (Layer 3 switches? How quaint.

This year, I want IS to buy me several application switches), the hackers — and the researchers who track them — have been keeping up the pace.

Bored with simple packet-type hacking and even more-sophisticated application-based worms, hackers are now into messing with people's minds. They've apparently gotten sophisticated — and prevalent — enough to warrant their own catchphrase and research project at Dartmouth College: Semantic Hacking (go to [www.nwfusion.com](http://www.nwfusion.com), DocFinder: 9246, for details):

"A semantic attack is one in which the attacker modifies electronic information in such a way that the result is incorrect but looks correct to the casual or perhaps even the attentive viewer," says one of the papers on the site. "[The program] is developing a categorization of semantic attacks, as well as implementing a set of techniques for detecting semantic attacks."

One paper on the site defines this sort of hacking as "an attack directed at the mind of the user of a computer system," and posits a theoretical countermeasure: "For example, faced with a potentially deceptive news item, an automated countermeasure might provide an alert using adaptive fraud-detection algorithms."

All well and good, but, um, guys, how is this different from propaganda? And who is to say one man's truth (DocFinder: 9247) isn't another man's hacking (DocFinder: 9248)?

As the authors of another paper on the site noted (DocFinder: 9249):

"Clearly the line between commercial uses of the Internet such as advertising, which would not be considered as cognitive hacking, and manipulation of stock prices by the posting of misinformation in news groups, which would be so considered, is a difficult one to distinguish."

### IT pro: Heal thyself

Jim Stewart delves into a leading principle in medicine: "Learn one, do one, teach one," which, means doctors should strive to learn new procedures, do them and then pass on what they've learned to other doctors. He wonders why IT couldn't replicate that (get more information at DocFinder: 9250): "I wish that this ethic existed in the IT industry. Think of the benefit. First, there would be an acknowledgment that the new employees don't know all they need to and aren't expected to know. Second, there would be a further expectation that it will take some time and much effort to become proficient. And third, those who are the most competent would be expected to pass along [their] expertise."

### More 2004 predictions

SlashNot foretells the coming year, including: "Anti-spam software will finally become useful, allowing you to blame it for not getting e-mail from people you don't want to talk to," and "Dell commercials will suck so badly that a few people will actually die watching them." See the rest at DocFinder: 9251.

### Secure those proxy servers

Adventures of an Open Proxy Server (DocFinder: 9252) discusses how hackers are exploiting proxy servers: "Web traffic has grown at a phenomenal rate over the past seven years. Companies and ISPs often turn to caching proxy servers to reduce the tremendous load on their networks. In order to satisfy the demands of their content-hungry users, these proxy servers are often configured to proxy any port, with little regard to security. If there are no access controls blocking connections from outside the network, it makes it possible to anonymously portscan the entire TCP port range of other outside systems."

*Gaffin is executive editor of Network World Fusion, when not filling in for Buzz McNamara who's out on a short-term medical leave (get better, Paul!). Reach him at [agaffin@nww.com](mailto:agaffin@nww.com).*



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